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A CATALOGUE OF THE FRESH-WATER FISHES OF SOUTH AMERICA

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The present paper is an enumeration of the fishes so far recorded from the streams and lakes of South America, with a few preliminary remarks on the extent, peculiarity, and origin of the fauna and the division of the neotropics into provinces. An attempt has been made to include those marine forms which have been found in the rivers beyond brackish water and to exclude those which probably enter fresh waters, but have not actually been found in any streams. Central American species are not enumerated.

The aim being to present a synopsis of what has been accomplished rather than a list of the species which in our estimation are valid, all the doubtful species are enumerated and the synonyms of each species are given. All the names given to South American fishes prior to 1890 are therefore to be found here.

We have endeavored to adopt and incorporate the results of the latest investigations, chiefly those of Günther, Gill, Cope, Boulenger, Steindachner, and Eigenmann and Eigenmann. Since works of a revisionary character on South American fishes are few, and many of the species have been recorded but once, many changes in the present list will doubtless become necessary. We have critically reviewed about half of the species enumerated. (See bibliography.)

This catalogue was intended to accompany a Catalogue of the Fresh-water Fishes of North America by Dr. D. S. Jordan. Unavoidable circumstances prevented us from completing it as originally planned, and it was thought best to give it the present form. We take pleasure in expressing out thanks to Dr. Theodore Gill for valuable suggestions.

EXTENT OF THE SOUTH AMERICAN FRESH-WATER FAUNA.

There are far more fresh-water fishes in the neotropical than in any other region.[1] Complete enumerations of the fresh-water fishes of other continents are rare, but the following comparison of the latest lists of European and North American fresh-water fishes with a list of the South American species will show the extent of the South American fauna. Those families which are marine, but whose species enter fresh waters, are marked with an asterisk (*).

	Species.	European species.	North American species.	South American species.	General distribution of families.
	HYPEROARTIA.				
Lamprey.	* Petromyzontidæ	3	8	3	Temperate and arctic regions.
	RAIÆ.				
Electric rays.	* Torpedinidæ			1	In most seas.
Sting rays.	* Dasybatidæ			9	Warm seas.
	SELACHOSTOMI.				
Paddlefish.	Polyodontidæ		1		North America and Asia.
	GLANIOSTOMI.				
Sturgeon.	* Acipenseridæ	10	6		Northern.
	DIPNOI.				
Lungfishes.	Lepidosirenidæ			1	Africa.
	GINGLYMODI.				
Gar pike.	Lepidosteidæ		3		North American.
	HALECOMORPHI.				
Bowfin.	Amiatidæ		1		
	SYMBRANCHIA.				
	Symbranchidæ			1	India.

[1] Heilprin (Distribution of Animals. International Scientific Series D, Appleton & Co., 1887, p. 79) says: "The fresh-water fishes of the Neotropical realm are specifically more numerous than those of any other region, with perhaps the exception of the Holarctic." The Holarctic is defined as follows (p. 56): "The Palæarctic and Nearctic tracts, in the absence of both positive and negative faunal characters of sufficient importance to separate them from each other, are indisputably linked together, and should constitute but a single region (the Holarctic)." Leaving out of consideration all animals but fishes, there are certainly both negative and positive characters to separate the Palæarctic and Nearctic. Mr. Heilprin enumerates the following peculiarities as separating the Nearctic from the Palæarctic: The presence in the Nearctic of *Catostomidæ*, *Centrarchidæ*, *Amiatidæ*, *Lepidosteidæ*. To these should be added the *Hiodontidæ*, *Percopsidæ*, *Amblyopsidæ*, *Aphredoderidæ*. *Elassomatidæ*, and the peculiar development of the *Percidæ*. From an ichthyological standpoint there are certainly positive characters sufficient to separate the Nearctic from the Palæarctic.

Species.		European species.	North American species.	South American species.	General distribution of families.
	NEMATOGNATHI.				
	Aspredinidæ	.....	.....	15	South American.
	Diplomystidæ	.....	.....	1	Chilian.
Catfish.	Siluridæ	1	25	199	Cosmopolitan.
	Hypophthalmidæ	.....	.....	2	South American.
Mountain catfish.	Pygidiidæ	.....	.....	48	Do.
Do.	Argiidæ	.....	.....	8	Do.
Mailed catfish.	Loricariidæ	.....	.....	151	Do.
	Callichthyidæ	.....	.....	25	Do.
	EVENTOGNATHI.				
Sucker.	Catostomidæ	.....	51	.....	North American.
Loach.	Cobitidæ	3	.....	.....	Asia.
Carp.	Cyprinidæ	61	230	.....	Asia, Africa.
Characins.	Characinidæ	.....	1	456	Africa.
	GYMNONOTI.				
Electric eels.	Electrophoridæ	.....	.....	1	South American.
	Sternopygidæ	.....	.....	30	Do.
	ISOSPONDYLI.				
Moon-eye.	Hiodontidæ	.....	3	.....	North American.
Herring.	* Clupeidæ	2	5	3	All seas.
Gizard shad.	* Dorosomidæ	.....	1	.....	Warm seas.
Big-eyed herring.	* Elopidæ	.....	1	1	Chiefly in warm seas.
	Osteoglossidæ	.....	.....	1	Australia.
	Arapaimidæ	.....	.....	1	
	* Stolephoridæ	.....	.....	8	All warm seas.
	Galaxiidæ	.....	.....	5	Tasmania, New Zealand, South America (southern).
	Aplochitonidæ	.....	.....	2	Do.
Salmon.	Salmonidæ	12	28	.....	Northern.
Trout perch.	Percopsidæ	.....	1	.....	North American.
	HAPLOMI.				
Blind fish.	Amblyopsidæ	.....	5	.....	North American.
Killifish.	* Cyprinodontidæ	3	52	29	Warm seas.
Pike.	Esocidæ	1	5	.....	Northern.
Mud minnow.	Umbridæ	1	1	.....	
	XENOMI.				
Blackfish.	Dalliidæ	.....	1	.....	Alaskan, Siberian.
	ENCHELYCEPHALI.				
Eels.	* Angnilidæ	2	1	.....	Warm seas.
	SYNENTOGNATHI.				
Garfishes.	* Belonidæ	.....	.....	5	Warm seas.
	HEMIBRANCHII.				
Sticklebacks.	* Gasterosteidæ	3	7	.....	Northern.
	PERCESOCES.				
Mullet.	* Mugilidæ	.....	.....	3	Warm seas.
Silversides.	* Atherinidæ	2	2	3	Do.
	PERCOMORPHI.				
	Polycentridæ	.....	.....	3	Northern South America.
Pirate perch.	Aphredoderidæ	.....	1	.....	North American.
	Elassomatidæ	.....	2	.....	Do.
Sunfishes.	Centrarchidæ	.....	37	.....	Do.
Perches.	Percidæ	11	72	.....	Temperate regions of America and Europe.

	Species.	European species.	North American species.	South American species.	General distribution of families.
	PERCOMORPHI—continued.				
Sea bass.	*Serranidæ	1	4	5	Warm seas
	*Sparidæ	.....	.....	1	Do.
Croakers.	*Sciænidæ	.....	1	11	Do.
Cichlids.	Cichlidæ	.....	2	86	Africa, Asia.
Gobies.	*Gobiidæ	2	6	15	Warm seas.
Sculpins.	*Cottidæ	2	21	.....	Northern.
Toadfish.	*Batrachidæ	.....	.....	3	Warm seas.
	*Blenniidæ	3	.....	.....	Do.
	*Gadidæ	1	1	.....	Northern.
	HETEROSOMATA.				
Flounders.	*Pleuronectidæ	2	1	10	All seas.
	PLECTOGNATHI.				
Puffers.	*Tetraodontidæ	.....	.....	1	Warm seas.
	Total	126	587	1,147	

It will be seen from the preceding list that, even if one or two hundred names are eliminated as probable synonyms, the preponderance of species is still largely in favor of South America. It must also be borne in mind that perhaps not more than two-thirds of the fishes of South America are now known. Many will doubtless not be discovered until there are resident ichthyologists. Only sixty species of fresh-water fishes have been recorded from the large system of the Rio Magdalena. If this number be compared with the forty species taken from Bean Blossom Creek, in Monroe County, Indiana, a small stream not half a dozen yards wide and which was explored along but one mile of its course, the amount of work left undone in the fresh waters of South America may be estimated.

From the American portion of the southern zone,[1] that is, from the whole region south of the La Plata, but eighteen species of fresh-water fishes are known. The headwaters of the La Plata, Magdalena, Orinoco, and of the tributaries of the Amazons and most of the rivers between the Amazon and the San Francisco are, from an ichthyological standpoint, unknown.

Only half of the collections of the Thayer expedition has, as yet, been examined, and many new forms will doubtless be added whenever the remaining portion is studied.

To the number enumerated here should be added the hundred and fifty species of fresh-water fishes recorded from the Mexican and Antillean subregions. The number of known species of neotropical fresh-water fishes is therefore nearly 1,300.

[1] For the limits of this zone, see Günther, "The Study of Fishes," p. 248.

RELATIONS OF THE SOUTH AMERICAN FRESH-WATER FAUNA TO THOSE OF OTHER CONTINENTS.

A striking feature of the South American fauna is the presence of marine forms, such as species of *Dasybatidæ*, *Tetraodontidæ*, *Sciænidæ*, *Batrachidæ*, etc. These, however, ought not here to be considered, although many of their species live exclusively in fresh waters, since the families of which they are representatives inhabit all warm seas.

If these families are left out of consideration it will be seen from the preceding list that there are but three families common to North and South America. The first of these, the Siluridæ, is cosmopolitan. The species of Siluridæ found in North America belong to the subfamily *Bagrinæ*, while the South American species belong to the subfamilies Tachisurinæ, *Callophysinæ*, Pimelodinæ, *Doradinæ*, *Auchenipterinæ*, and *Ageneiosinæ*. Of the subfamilies found in South America, those in italics are enneotropic.* The *Tachisurinæ* are found in all tropical seas, and, for the present purpose, should really be classed with the marine fishes. The *Pimelodinæ* have a few representatives in Africa.

The second and third families, the *Cichlidæ* and *Characinidæ*, have each but one representative extending as far north as Texas.

From the foregoing statements it will be noticed that the South American fauna has little in common and small relationship with the fauna of North America. Central America properly belongs to the South American fauna, while southern Mexico is debatable ground. Several species of *Pimelodinæ*, *Cichlidæ*, and *Characinidæ* occur in southern Mexico. On the other hand, one species of *Bagrinæ*† extends as far south as Guatemala, and another‡ is found on the western slope of central Mexico.§ A species of *Lepidosteus*, an ennearctic genus, has a representative in the western part of Guatemala.

Leaving out of consideration the family *Siluridæ*, which has been discussed above, there remain eighteen truly fresh-water families, eleven of which are enneotropic. Of the remaining seven families two, *Galaxiidæ* and *Aplochitonidæ*, are found only in the Fuegian region, and have representatives in Tasmania and New Zealand. The other five are distributed as follows:

Lepidosirenidæ 1 sp.; Africa 2 sp.
Symbranchidæ 1 sp.; India 2 sp.
Characinidæ 456 sp.; Africa 86 sp.
Osteoglossidæ 1 sp.; Australia 1 sp.; East Indian Archipelago 1 sp.
Cichlidæ 86 sp.; Africa 29 sp.; India 2 sp.

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* *Enneotropic*, *ennearctic*, etc., formed like endemic, the *en* having the force of "peculiar to."

† *Ictalurus meridionalis* (Günther).

‡ *Ictalurus dugesi* (Bean).

§ *Ictalurus punctatus* (Rafinesque) has been recorded from Surinam. As this species has not been taken during the last 30 years it is perhaps wisest to doubt the correctness of this record.

It will be seen that all but two of the tropical American families not peculiar to America are found in Africa.

There is no species of tropical American fishes known to inhabit any other continent, and but two genera, *Osteoglossum* and *Symbranchus*, are found elsewhere. It is a surprising fact that, although there exists the great similarity between the African and the South American faunas already pointed out, these two genera are not found in Africa. *Symbranchus* inhabits South America and India, *Osteoglossum* South America, Australia, and East Indian Archipelago.*

We have already called attention to the fact that but one of the South American subfamilies of *Siluridæ* is found elsewhere. The *Pimelodinæ* reaches its greatest development in South America (63 species), while in Africa there are but two genera (4 species).

Of the ten subfamilies of the *Characinidæ* four† are enneotropic, three are enafric,‡ and three§ are common to both.

THE PECULIARITIES OF THE SOUTH AMERICAN FAUNA.‖

As is usual with fresh-water faunas the great majority of South American fishes belong to the Physostomous Teleosts. In the words of Wallace: "Richness combined with isolation is the predominant feature of Neotropical Zoölogy, and no other region can approach it in the number of its peculiar family and generic types."

The families peculiar to South America are: (1) *Diplomystidæ*, (2) *Aspredinidæ*, (3) *Hypophthalmidæ*, (4) *Pygidiidæ*, (5) *Argiidæ*, (6) *Loricariidæ*, (7) *Callichthyidæ*, (8) *Gymnotidæ*, (9) *Sternopygidæ*, (10) *Polycentridæ*. The first seven belong to the degenerate order Nematognathi. The absence of scales, imperfect maxillary, coössified parietals and supraoccipital, the absence of subopercle and coössified anterior vertebræ, distinguish this order. With very few exceptions the species of this order are provided with barbels, which, in some species of *Pimelodinæ*, are greatly specialized, being much longer than the whole fish.

The *Diplomystidæ*, of which but a single species is known, is undoubtedly the lowest of the *Nematognathi* and is a remnant of the primitive

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* Perhaps attention should again be called to the *Siluridæ*. The genus *Tachisurus* has representatives in the fresh waters of South America, Africa, and India. It is, however, a marine genus.

† *Erythrininæ, Curimatinæ, Anostomatinæ, Serrasalmoninæ.*

‡ *Citharininæ, Distichodinæ, Ichthyborinæ.*

§ *Crenuchinæ, Tetragonopterinæ, Hydrocyoninæ.*

‖ We wish to call attention to a fact noticed while studying the Nematognathi. The southern representatives of several genera or even of the same species have not infrequently more rays than the Amazonian forms. All the specimens of *Pseudopimelodus zungaro* recorded from the Amazon have six dorsal rays, while three of the specimens from the south have seven dorsal rays. All the Amazonian species of the genus Rhamdia have six dorsal rays, while the southern forms of the same genus frequently have seven or eight; one peculiar to the La Plata has six to nine, and another confined to the San Francisco has ten rays. We have not followed this subject in detail and do not know whether the increase in rays is correlated with an increase of vertebræ.

stock. The maxillary, in this family, bears teeth and forms part of the mouth border. Only two short barbels are present. In all other families of this order the maxillary is vestigiary, its sole function being to serve as a basis for the primary barbel. Through the *Tachisurinæ* the *Diplomystidæ* are very closely related to the *Siluridæ*.

Through *Ageneiosus* the *Hypophthalmidæ* are closely related to the *Siluridæ*.

The *Aspredinidæ* are highly specialized and are evidently an early offspring from the common stock.

The *Pygidiidæ* are the mountain forms of the *Siluridæ*, but have undergone many important modifica ions.

The *Argiidæ* are the mountain forms of the *Loricariidæ*.

The *Aspredinidæ* are the most specialized of the Nematognathi. The mouth and the air-bladder are greatly modified, while the body is covered with small bony plates.

The *Callichthyidæ* are in some sense intermediate between the *Siluridæ* and the *Loricariidæ*. They have a normal mouth and the body covered with two series of bony plates.

The *Electrophoridæ* and *Sternopygidæ* constitue the order *Gymnonoti*.

The *Gymnotidæ* differ from the *Sternopygidæ* in being naked and in possessing an electric organ. The members of both families are long, eel-shaped fishes without a true dorsal fin, without ventral fins, and having a very long anal fin.

None of the *Percomorphi* are peculiarly South American, the only remaining family being the *Polycentridæ*, whose position in the system is not definitely determined.

Of the families having a wider distribution, but reaching, in South America, a peculiar development, must be mentioned the marine forms, which, in other regions, do not ascend much beyond brackish water, but which here are found even at a great distance from the sea. Chief of these are the *Dasybatidæ*, *Belonidæ*, *Mugilidæ*, *Sciænidæ*, *Batrachidæ*, *Pleuronectidæ*, *Tetraodontidæ*.

Of especial interest is *Lepidosiren paradoxa*, which represents an ancient order of fishes.

The *Siluridæ* here reach their greatest perfection, forty-eight genera of one hundred and ninety-nine species being found in fresh waters, while several species inhabit the surrounding seas. They are generally inhabitants of the low lands. The peculiarities of the *Pimelodinæ* are the remote nares, which are not provided with a barbel, and the great development of the maxillary barbels.

The *Callophysinæ* are *Pimelodinæ* with incisor-like teeth.

The *Doradinæ* are provided with a lateral series of bony plates.

The *Ageneiosinæ* have a peculiarly modified air-bladder.

The *Auchenipterinæ* are very closely related to the *Ageneiosinæ*, but possess a normal air-bladder.

The *Characinidæ* also here attain their greatest development. There are sixty-one genera of four hundred and thirty-five species.

The *Erythrininæ* are without an adipose fin.

The *Curimatinæ* are edentulous, or have the teeth feebly developed. They differ from the *Citharininæ* (African) chiefly in having a shorter dorsal fin.

The *Anostomatinæ* have a short dorsal fin, narrow gill-opening, and remote nares, the teeth being well developed.

The *Tetragonopterinæ* and *Hydrocyoninæ* differ in the character of the teeth, the former having broad notched, the latter conical teeth. The dorsal fin is rather short in both. Both reach their greatest development in South America. There are in South America eighteen genera of one hundred and fifty-nine species of *Tetragonopterinæ* and but four genera of twenty-nine species in Africa. Of the *Hydrocyoninæ* there are eleven genera of fifty-four species against two genera and five species in Africa.

The *Crenuchinæ* consist of two genera of one species each, found respectively in South America and Africa.

The *Serrasalmoninæ* are characterized by the large teeth and serrated belly.

The *Cichlidæ* is another family which reaches its greatest development in South America.

THE ORIGIN OF THE SOUTH AMERICAN FAUNA.

The species of marine families need, in this connection, only a passing notice. Many of the species live habitually in the sea and enter rivers only occasionally. The families having strictly fresh-water species or genera are the *Dasybatidæ*, *Cyprinodontidæ*, *Belonidæ*, *Mugilidæ*, *Serranidæ*, *Sciænidæ*, *Batrachidæ*, and *Tetraodontidæ*. Some of these, as the genus *Orestias*, are evidently of very long standing. This genus of four species confined to Lake Titicaca was evidently long ago—long before the Andes had reached their present height—separated from the ordinary forms inhabiting brackish water. Other genera belonging to this category are: *Protistius* Cope, a genus intermediate between the *Mugilidæ* and the *Cyprinodontidæ* found in the Peruvian Andes at an elevation of 12,000 feet, and *Gastropterus* Cope (*Mugilidæ*) from the Pacific slope of Peru at an altitude of 7,500 feet.

The genera *Percichthys* and *Percilia* have also been long enough separated from their marine ancestors to become generically distinct.

The fresh-water genera and species of *Belonidæ*, *Sciænidæ*, *Batrachidæ*, and *Tetraodontidæ* live chiefly in the lower courses of rivers and are probably older additions from the sea.

The *Lepidosirenidæ*, a family of few genera and species, is evidently now in its last stages. No fossils of *Lepidosiren* have yet been found. The Dipnoi made their appearance in the Triassic (Permian; Bohemia, Texas). "Remains of *Ceratodus* have been found throughout the en-

tire series of Mesozoic deposits from the Trias to the Cretaceous, inclusive." Their distribution has evidently become limited in later times and the living members may be looked upon as but remnants of an older fauna.

The number of species of the *Symbranchidæ* is also quite limited, while their geographic range is very large. Nearly all such cases are to be explained by a greater abundance and a wide distribution in former times. The living species enter brackish water, while one genus is strictly marine. Dr. Günther says of this fish (Study of Fishes, p. 226): "The occurrence and wide distribution in Tropical America of a fish of the Indian family *Symbranchidæ*, which is not only congeneric with, but also most closely allied to, the Indian *Symbranchus bengalensis*, offers one of those extraordinary anomalies in the distribution of animals of which no satisfactory explanation can be given at present."

The present is evidently the age of the *Nematognathi* and the *Eventognathi*. Probably all the species of *Nematognathi* of South America are autochthons of that continent. A pretty complete series still exists without taking into account any species of other regions. They are chiefly lower forms, although some of them have reached a high state of specialization in a certain direction. Their evolution has already been discussed by us in various places and it is not necessary to repeat all the considerations here.

The peculiarities of the *Diplomystidæ* have been pointed out above. We must conclude from the presence of dentiferous maxillaries and the absence of all the barbels except the maxillary,* either that this family represents the ancient *Nematognathi*, or that it is a reversion to the ancient forms. The former conclusion seems preferable. *Siluridæ* have been found in the eocene Tertiary of Europe, while the Wasatch beds, the lowest Tertiary of North America, have yielded several species of a genus (*Rhineastes*) probably related to the *Pimelodinæ*, from which

* The value placed on the maxillaries can not be questioned, while the value placed on the presence or absence of certain barbels is fully warranted both by the living forms of South America and by the embryology of *Ictalurus albidus* (Le Sueur). Professor Ryder (On the Development of Osseous Fishes, p. 49, Washington, 1886) says: "The remarkably developed barbels of the embryos of this species make their appearance very early, especially the maxillary pair; these appear on the second day. * * * The barbels on the lower jaw do not appear till the fourth day of development is completed. * * * The last of all to be developed is the nasal pair * * * [which] does not appear until the seventh day." Page 54: "Whether the endoskeletal part of the upper end of the so-called maxillary barbel in reality represents the maxillary bone of other fishes seems somewhat open to doubt, as the proximal ossification of the cartilaginous support of this barbel would give this element in the catfishes a cartilaginous origin, which is at variance with what is known of the development of its homologue in all other forms of Teleosts, in which it arises as a membrane bone." At the time of writing this Professor Ryder was probably not familiar with the peculiar Diplomystes.

the present North American forms are, not unlikely, lineal descendants.*

As the *Silurinæ* and *Pimelodinæ* were already differentiated near the beginning of the Tertiary, the *Diplomystidæ* must have originated still earlier.

The *Tachisurinæ* were the first to be differentiated from the *Diplomystidæ*. How close the existing intergradation between them may be can not be told from the imperfect knowledge of *Paradiplomystes*, etc. They most probably arose in South America. At present the species are chiefly marine and it is not unlikely that several other subfamilies besides the *Pimelodinæ* are directly derived from them.

The *Pimelodinæ* are *Tachisurinæ* with remote nares. They now flourish most where they probably had their origin. From the *Pimelodinæ* have been derived directly or indirectly a number of subfamilies and families. The furthest development in one direction has been reached by the *Aspredinidæ*, while the development in the other direction culminates in the *Loricaridæ*. There does not seem to exist a sufficient break in the South American series to warrant the supposition that any of the subfamilies were developed elsewhere and have immigrated. They all must be autochthons of the neotropical region.

The *Eventognathi* and *Gymnonoti* form, with the order just considered, the superorder *Ostariophysea* of Sagemehl, which is distinguished from all other orders and superorders by the presence of a Weberian apparatus, or *ossicula auditus*, connecting the air bladder with the auditory apparatus. Some of the non-American families of the *Eventognathi* approach so closely to the *Nematognathi* that Valenciennes† had at one time some doubt whether *Pygidium*, a South American genus of *Nematognathi*, should not be placed with the *Cobitidæ*. The common descent of the three orders of *Ostariophysea* may be conceded. The *Eventognathi* seem to differ from the *Nematognathi* in the possession of a subopercle.

In the north temperate region three families of *Eventognathi* have become differentiated. In the tropics the order is represented by the family *Characinidæ*. The subfamilies *Erythrininæ*, *Curimatinæ*, *Anos-*

* Dr. Jordan (Science Sketches, p. 100) says: "The catfishes of [North] America are all probably descendants of a common stock, not allied to South American forms, but probably finding its nearest relatives in India. A single species of this type now exists in China (*Amiurus cantonensis*); but this is perhaps a returned emigrant from America rather than a direct offshoot of the parent stock. Even before becoming acquainted with Professor Cope's work, "Tertiary Vertebrata," it seemed to us that the *Bagrinæ* were derived from the *Pimelodinæ*. The presence of a genus of *Tachisurinæ* or marine *Pimelodinæ* in the North American Tertiary deposits (Dr. Cope was unable to decide which) confirmed my previous notions. The American *Bagrinæ* are *Pimelodinæ* plus a nasal barbel, the last barbel to be developed. They resemble most the *Pimelodinæ* with vomerine teeth, and indeed, the genus *Rhinecastes* possesses them.

† See Histoire Naturelle des Poissons, vol. 18, p. 486 (*note*).

tomatinæ, and *Serrasalmoninæ* are certainly autochthons of South America and probably later differentiations. The *Tetragonopterinæ*, *Hydrocyoninæ*, and *Crenuchinæ* are, as has been shown under "Relations of the South American Fresh-water Fauna," found both in Africa and South America. No doubt need be entertained about the origin of the genera now found in South America, as they are all peculiar to it. "On the other hand," says Dr. Günther (Study of Fishes, p. 233), "the existence of so many similar forms on both sides of the Atlantic affords much support to the supposition that at a former period the distance between the present Atlantic continents [Africa and South America] was much less, and that the fishes which have diverged towards the east and west are descendants of a common stock which had its home in a region now submerged under some intervening part of the ocean."* Certain it is that the great preponderance of *Tetragonopterinæ* and *Hydrocyoninæ* are found in South America, and that there these subfamilies probably had their origin.

Such anomalies as the presence of one species of *Crenuchinæ* in South America and another in Africa is at present unexplainable.

The two families of the *Gymnonoti* need few words. They are not, and probably never have been, found outside South America.

The *Osteoglossidæ* are probably a family in its last stages.

In the *Galaxiidæ* and *Aplochitonidæ*, which belong to the south temperate fauna, is seen the wide distribution of genera, and even of species, common in the north temperate region. There seems to be nothing anomalous in their present wide distribution.

The *Polycentridæ*, like the *Sternopygidæ* and *Electrophoridæ* have not been found beyond South America, and they are undoubtedly autochthons.

GEOGRAPHICAL DISTRIBUTION.

The distribution of the neotropical fishes presents well nigh all possible conditions. There are species and genera of marine families

* Wallace says in this connection: "The great continent of South America, as far as we can judge from the remarkable characteristics of its fauna and the vast depth of the oceans east and west of it, has not during Tertiary, and probably not even during Secondary times, been united with any other continent, except through the intervention of North America. * * * What its earlier condition was we can not conjecture, but there are clear indications that it has been broken up into at least three large masses, and probably a number of smaller ones, and these have no doubt undergone successive elevations and subsidences, so as at one time to reduce their area and separate them still more widely from each other, and at another period to unite them into continental masses. The richness and varied development of the old fauna of South America, as still existing, proves, however, that the country has always maintained an extensive area; and there is reason to believe that the last great change has been a long continued and steady increase of its surface, resulting in the formation of the vast alluvial plains of the Amazon, Orinoco, and La Plata, and thus greatly favoring the production of that wealth of specific forms which distinguishes South America above all other parts of our globe."

found in streams and lakes at altitudes of 13,000* to 15,000 feet, while some Alpine forms descend to the sea.†

Some marine genera have, contrary to *a priori* conceptions, species which are confined to some one river,‡ while species which are strictly fresh-water have unexpectedly wide ranges.§

Many genera of wide distribution are confined to the eastern slopes while genera of narrower distribution‖ occur on both sides. Some genera have few species which inhabit neighboring rivers,¶ while the species of some other small genera inhabit widely separated regions.**

The distribution has been discussed by Agassiz, Wallace, Cope, and Günther. Agassiz†† speaks of the distribution of the fishes found on his journey from Para to Tabatinga. His discussions are, however, more valuable as field notes and suggestions than as a contribution to the subject, since he did not consult the works of previous writers. He was especially impressed by the localization of species, which was in great part due to mistaking the variations of a species as distinct species, and to the fact noted above that many of the species supposed by him to be restricted to a peculiar spot had been collected in other localities by other explorers. On page 244 Agassiz says: "To this day I have not yet recovered from my surprise at finding that shores which, from a geographic point of view, must be considered simply as opposite banks of the same stream, were, nevertheless, the abode of an essentially different ichthyological population." This is nothing more than what is to be observed at a given locality of many rivers or along most coasts. At Wood's Holl, Massachusetts, or at San Diego, California, for instance, different species inhabit restricted areas within a few square miles, one set of species rarely entering the locality of the other. For this reason some species are always associated with certain other species. The same holds good of rivers and creeks. In a small stream in Indiana the numerous species of darters are found at one point; half a mile further on are species of *Noturus*, beyond which are species of *Amiurus*, etc. To Professor Agassiz, however, belongs the credit of first calling attention to this fact.

Wallace‡‡ devotes but little attention to fresh-water fishes, summarizing the accounts in Dr. Günther's Catalogue of Fishes.

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* *Orestias* (*Cyprinodontidæ*), *Gastropterus*, *Protistius* (*Mugilidæ*).

† *Pygidium pardum* (Pygididæ) in Callao Bay.

‡ *Tachisurus grandoculis* in the Rio Doce.

§ *Callichthys callichthys*; *Hoplosternum littorale*, etc., La Plata to Trinidad; *Pimelodus clarias*, etc., La Plata to Rio Magdalena.

‖ *Cetopsis*.

¶ *Steindachneria* with three species: (1) *amblyura* in the Jequitinhonha; (2) *doceana* in the Rio Doce; (3) *parahybæ* in the Rio Parahybæ.

** *Stegophilus* with six species: (1) *maculatus* in the La Plata; (2) *punctatus* at Canelos, Ecuador; (3) *intermedius* at Goyaz; (4) *macrops* at Manacapuru; (5) *insidiosus* in the Rio das Velhas; (6) *reinhardti* in the Solimoens and its tributaries.

†† A journey in Brazil. Boston: Ticknor & Fields, 1868.

‡‡ The Geographical Distribution of Animals. Harper & Bros.: New York, 1876.

Dr. Günther[1] treats of the distribution of South American fishes more in general. He divides South America into the neotropical region and the Fuegian subregion, separated by a line from the tropic "until it strikes the western slope of the Andes * * * where it again bends southwards to embrace the system of the Rio de la Plata." Leaving out of consideration all the marine forms entering or inhabiting rivers, he enumerates 672 fresh-water fishes in the whole of the neotropical region, including Mexico and the West Indies. This subdivision of the South American portion of the neotropics is a natural one as far as fishes are concerned, and it is adopted here.

Before discussing the subregions, provinces, etc., more in detail, we present the following lists of genera peculiar to the different localities. Since almost all genera are here accounted for, it will be seen that South America is divided into well-defined provinces.

I.

Genera peculiar to Chili, Patagonia, Argentine Republic, and Terra del Fuego:

1. Diplomystes.....1 sp., Chili
2. Nematogenys.....1 sp., Chili
3. Percichthys.4 sp., Chili and Patagonia
4. Percilia.....1 sp., Chili

(Petromyzontidæ.)

These genera, four in number, are the only ones inhabiting the large Fuegian subregion of the southern zone which are not also found in the Brazilian subregion. Several genera of wide distribution, especially *Pygidium*, have representatives here.

The following lists, exclusive of XVII and XVIII, characterize the Brazilian subregion. A few of the genera have also representatives in the Mexican subregion.

II.

Genera with representatives in all or nearly all the rivers from the La Plata to the Magdalena. Those having representatives on the western slopes are marked with an asterisk (*), those not yet recorded from the La Plata are marked with a dagger (†), those not yet found in the Rio Magdalena are marked with a double dagger (‡):

1. Pseudopimelodus..... 6 sp.
2. Rhamdia *.....22 sp.
3. Pimelodella.....12 sp.
4. Pimelodus.....13 sp.
5. Trachycorystes†.....13 sp.
6. Pseudauchenipterus†..... 4 sp.
7. Agéneiosus.....12 sp.
8. Loricaria.....34 sp.
9. Plecostomus*.....28 sp.
10. Rhinelepis†..... 3 sp.
11. Callichthys‡..... 2 sp.
    Described as 11 species.
12. Hoplosternum‡..... 3 sp.
    Described as 13 species.
13. Corydoras‡.....12 sp.
14. Macrodon..... 2 sp.
    Described as 12 species.
15. Erythrinus†..... 4 sp.

[1] The Study of Fishes. Black: Edinburgh, 1880.

16. Curimatus* .....44 sp. and var.
17. Prochilodus* .....22 sp.
18. Leporinus .....28 sp.
19. Tetragonopterus* .....71 sp.
    Sixteen other species in Central America to United States.
20. Cheirodon* ..... 9 sp.
21. Brycon* .....34 sp.
22. Xiphoramphus .....12 sp.
23. Astronotus .....38 sp.
    Many species in Central America and Mexico.
24. Crenicichla† .....27 sp.
25. Geophagus† .....22 sp.

Average number of species to each genus, 15+.

III.

Genera having representatives in the rivers from the La Plata to the Rio Magdalena, exclusive of those of southeastern Brazil. Those not yet recorded from the Magdalena marked with an asterisk (*):

1. Pseudoplatystoma .... 7 sp. and var.
2. Platystoma ..... 1 sp.
3. Doras ..... 24 sp.
4. Oxydoras ..... 4 sp.
5. Stegophilus ..... 6 sp.
6. Hemiancistrus ..... 17 sp.
7. Ancistrus ..... 8 sp.
9. Hemiodus[1] ..... 10 sp.
10. Parodon[2] ..... 3 sp.
11. Anostomus* ..... 10 sp.
12. Chalcinus ..... 9 sp.
13. Gasteropelecus* ..... 4 sp.
14. Raeboides ..... 8 sp.
15. Cynopotomus ..... 7 sp.
16. Pygocentrus ..... 7 sp.
17. Serrasalmo ..... 14 sp.
18. Myletes* ..... 31 sp.
19. Sternarchus* ..... 9 sp.
20. Sternopygus ..... 6 sp.
21. Carapus..... 1 sp. (described as 7.)

Average number of species to each genus, 9.25.

IV.

Genera with representatives on both slopes of the Andes:

1. Rhamdia[3] ..... 22 sp.
2. Pimelodella[4] ..... 12 sp.
3. Cetopsis[5] ..... 6 sp.
4. Pygidium[6] ..... 25 sp.
5. Loricaria[7] ..... 34 sp.
6. Plecostomus[8] ..... 28 sp. and var.
7. Chaetostomus ..... 20 sp.
8. Macrodon ..... 2 sp.
9. Curimatus[9] ..... 43 sp. and vars.
10. Tetragonopterus[10] ..... 71 sp.
    (Others in Central America, etc.)
11. Cheirodon[11] ..... 9 sp.
12. Brycon[12] ..... 34 sp.
    Two additional sp. in Central America.

Average number of species to each genus, 25½.

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[1] *H. unimaculatus* in the Cujaba.

[2] Only in the La Plata, San Francisco and Amazons.

[3] *Cinerascens* Guayaquil; Esmeraldas. *Wagneri*, east and west slopes of Panama.

[4] *Modestus*, western Ecuador, eastern Panama; *elongatus*, western Ecuador.

[5] *Occidentalis*, Guayaquil.

[6] Many species; Alpine forms.

[7] Several species at Panama, both eastern and western slopes.

[8] *Spinosissimus*, Guayaquil.

[9] *Troschelii*, Guayaquil; western Andes of Ecuador.

[10] *Brevirostris*, western Andes of Ecuador; *microphthalmus*, Rio Rimac; *polyodon*, Guayquil.

[11] *Pisciculus*, Santiago, Chili.

[12] *Atricaudatus*, western Andes of Ecuador.

V.

Genera peculiar to the western slopes of Peru, Ecuador, and Colombia:

1. Lebiasina ..... 1 sp.
2. Saccodon ..... 2 sp.
3. Pseudochalceus ..... 1 sp.
4. Gastropterus ..... 1 sp.

Average number of species to each genus, 1.25.

VI.

Genera peculiar to the Amazons and the region to the north of them, especially the Guianas. Those marked with an asterisk (*) have representatives in the Rio San Francisco:

1. Bunocephalus ..... 7 sp.
2. Aspredo ..... 6 sp.
3. Callophysus ..... 1 sp.
4. Phractocephalus ..... 1 sp.
5. Sorubimichthys ..... 3 sp.
6. Hemidoras* ..... 13 sp.
7. Trachelyopterus ..... 2 sp.
8. Centromochlus ..... 5 sp.
9. Auchenipterus ..... 3 sp.
10. Hypophthalmus ..... 1 sp.
11. Farlowella ..... 6 sp.
12. Hypoptopoma ..... 3 sp.
13. Panaque ..... 3 sp.
14. Pterygoplichthys* ..... 8 sp.
15. Pyrrhulina ..... 9 sp.
16. Chilodus ..... 2 sp.
17. Nannostomus ..... 5 sp.
18. Piabucina ..... 4 sp.
19. Odontostilbe ..... 2 sp.
20. Chalceus ..... 2 sp.
21. Creatochanes ..... 3 sp.
22. Creagrutus* ..... 4 sp.
    Upper courses of rivers.
23. Piabuca ..... 2 sp.
24. Anacyrtus ..... 6 sp.
25. Rœstes ..... 2 sp.
    One species in Guatemala.
26. Exodon ..... 1 sp.
27. Xiphostoma ..... 6 sp.
28. Hydrolycus ..... 4 sp.
29. Cynodon ..... 2 sp.
30. Crenuchus ..... 1 sp.
31. Mylesinus ..... 1 sp.
    Boundaries of distribution not well defined.
32. Pygopristis ..... 2 sp.
33. Electrophorus ..... 1 sp.
    Southern boundaries not well defined.
34. Rhamphosternarchus ..... 5 sp.
35. Rhamphichthys ..... 3 sp.
36. Brachyrhamphichthys ..... 5 sp.
37. Osteoglossum ..... 1 sp.
38. Potamorrhaphis ..... 1 sp.
39. Plagioscion ..... 4 sp.
40. Cichla ..... 4 sp.
41. Chætobranchus ..... 4 sp.
42. Colomesus ..... 1 sp.

Average number of species to each genus, 3.5.

VII.

Genera peculiar to the Amazons (Amazon, Solimoens, Marañon) and their tributaries.

Those genera found in but two of the rivers are included here:

1. Lepidosiren ..... 1 sp.
2. Piramutana ..... 1 sp.
3. Platynematichthys ..... 2 sp.
4. Sciades ..... 2 sp.
5. Auchenipterichthys ..... 2 sp.
6. Epapterus ..... 2 sp.
7. Vandellia ..... 2 sp.
8. Pareiodon ..... 2 sp.
9. Hemiodontichthys ..... 1 sp.
10. Paraneistrus ..... 3 sp.
11. Acanthicus ..... 3 sp.
12. Decapogon ..... 1 sp.

13. Læmolyta*	1 sp	19. Mesonauta	1 sp.
14. Anodus	3 sp.	20. Crenicara	1 sp.
15. Potamorhina	1 sp.	21. Dicrossus	1 sp.
16. Bryconops	2 sp.	22. Uaru	3 sp.
17. Stethaprion	3 sp.	23. Astronotus	3 sp.
18. Monocirrhus	1 sp.	24. Symphysodon	1 sp.

Pterophyllum 1 sp.

Average number of species to each genus about $1\frac{3}{4}$.

VIII.

Genera peculiar to the Amazon and its tributaries, including the Rio Negro:

1. Elipesurus	1 sp.	4. Platystomatichthys	1 sp.
2. Bunocephalichthys	1 sp.	5. Oxyropsis	1 sp.
3. Pimelodina	2 sp.	6. Rhytiodus	2 sp.

Average number of species to each genus, $1\frac{1}{3}$.

IX.

Genera peculiar to the Solimoens and its tributaries:

1. Nemuroglanis	1 sp.	4. Miuroglanis	1 sp.
2. Trachelyopterichthys	1 sp.	5. Chætobranchopsis	1 sp.
3. Tridens	2 sp.	6. Saraca	1 sp.

Average number of species to each genus, $1\frac{1}{6}$.

X.

Genera peculiar to the Marañon and its tributaries.

1. Dysichthys	1 sp.	6. Brochis	4 sp. of 2 subgenera.
2. Nannoglanis	1 sp.	7. Plethodectes	1 sp.
3. Physopyxis	1 sp.	8. Iguanodectes	1 sp.
4. Stegophiloides	1 sp.	9. Aphiocharax	3 sp.
5. Dianema	1 sp.	10. Metynnis	1 sp.

Average number of species to each genus, 1.5.

XI.

Genera peculiar to the Guianas:†

1. Helogenes	1 sp.	4. Anableps	1 sp.
2. Agoniatus	1 sp.	One sp. in Guatemala.	
3. Catoprion	1 sp.	5. Polycentrus	2 sp.

Average number of species to each genus, $1\frac{1}{5}$.

XII.

Genera peculiar to the Rio Magdalena:

1. Eremophilus	1 sp.	3. Luciocharax	1 sp.
2. Astroblepus	1 sp.	(Found also in the Mamoni River.)	

* Since this was written it has been found that *Læmolyta* occurs also in the Orinoco and contains 4 species.

† *Stevardia* of four species in Trinidad.

XIII.

Genera peculiar to the San Francisco and its tributaries:

1. Bagropsis ..... 1 sp. | 2. Duopalatinus ..... 1 sp.

XIV.

Genera peculiar to the rivers of southeastern Brazil, between the Rio San Francisco and the La Plata, but exclusive of those rivers:

Genera.		Distribution.
1. Steindachneria	3 sp.	Parahyba; Doce; Jequitinhonha.
2. Wertheimeria	1 sp.	Jequitinhonha.
3. Harttia	1 sp.	
4. Hisonotus	1 sp.	Parahyba; Santa Cruz.
5. Parotocinclus	1 sp.	Santa Cruz.
6. Delturus	2 sp.	Rio Mucuri; Rio Parahyba.
7. Hemipsilichthys	1 sp.	Rio Parahyba.
8. Scleromystax	1 sp.	Rio Janeiro.
9. Henochilus	1 sp.	Rio Mucuri.

Average number of species to each genus, $1\frac{1}{3}+$.

XV.

Genera peculiar to the high Andes of Peru, Ecuador, and Colombia:

1. Arges ..... 4 sp. | 3. Orestias ..... 4 sp.
2. Cyclopium ..... 2 sp. | 4. Gastropterus ..... 1 sp.
5. Protistius, 1 sp.

Average number of species to each genus, 2.6.

XVI.

Genera peculiar to the La Plata and its tributaries:

1. Cochliodon, 1 sp.

XVII.

Genera of wide distribution. The lists to which they are most nearly related are indicated by Roman numerals:

Genera.		Distribution.
II. Rhamdella	8 sp. or more.	Southeastern Brazil; Amazon; Central America.
II. Chætostomus	20 sp.	Chiefly in upper courses of rivers.
II. Pygidium	25 sp.	Chiefly in mountainous regions.
II. Characidium	4 sp.	Parahyba to Orinoco; Marañon.
VII. Leporellus	1 sp.	Rio das Velhas; Amazons; Cauca.
VII. Paragoniatus	3 sp.	Amazons; Rio Janeiro.
III. Salminus	5 sp.	La Plata; San Francisco; Jacuhy; Cauca.
VI. Arapaima	1 sp.	Bahia; Amazons and northward.
I. Galaxias	5 sp.	Falkland Islands; Terra del Fuego; (Andes of Peru?).
I. Aplochiton	2 sp.	Terra del Fuego; Falkland Islands.
III. Pachyurus	4 sp.	San Francisco; La Plata; Amazons.

Average number of species to each genus, 7+.

XVIII.

Genera peculiar to Central America and Mexico. Those marked with an asterisk (*) are immigrants from North America, where they are still abundant:

1. Lepidosteus*	1 sp.	8. Belonesox	1 sp
2. Amiurus*	1 sp.	9. Mollienesia	
3. Ictalurus*	1 sp.	10. Xiphophorus	1 sp.
4. Dorosoma*	1 sp.	11. Platypœcilus	1 sp.
5. Characodon	2 sp.	12. Agonostomus	3 sp.
6. Girardinichthys	1 sp.	13. Chirostoma	2 sp.
7. Pseudoxiphophorus	2 sp.	14. Neotroplus	1 sp

The foregoing lists explain themselves in part, but a few remarks will not be altogether out of place. It will be seen that genera of many species usually have a wide distribution, and, conversely, genera of wide distribution usually have many species. A comparison of Lists II, III, IV, and XVI on the one hand, with Lists VII, VIII, IX, etc., and even VI, on the other, will show this in a striking manner. In List II, for instance, of the genera found distributed over the whole of the Brazilian subregion, each genus has at an average 15 species. In List III, whose genera have but a slightly more restricted distribution, each genus is composed of $9\frac{1}{4}$ species, at an average. In List VI, whose genera, while they have a wide distribution, are yet much more restricted than in the others mentioned, each genus has, on an average, but $3\frac{1}{2}$ species. The genera of List VII have on an average, but $1\frac{3}{4}$ species, and those of List VIII but 1. The number of species of each genus, therefore, varies directly as the extent of its distribution, and, conversely, the extent of the distribution of any genus varies directly as the number of species composing it.

There are a few genera which do not come under this general proposition. *Callichthys* has but two species, and *Hoplosternum* only three, but the limits of variations of the species of these two genera are so wide that the two species of *Callichthys* have received eleven different names, and the three of *Hoplosternum* thirteen. The most noted exception to the first half of the proposition is *Hemidoras* (List VI), with thirteen species.

At a first glance it might appear that a genus with a narrow distribution must necessarily, on account of its restriction, have few species, but a closer inspection will show that this is not the case. Taking, for instance, Lists II and VII: The genus *Pseudopimelodus* has four representatives in the region covered by VII; the genus *Rhamdia* twelve; *Pimelodella* five; *Pimelodus* seven; *Trachycorystes* five; *Pseudopimelodus* two; *Agenciosus* six; *Loricaria* nineteen, etc. This shows that the genera of wide distribution have, on average, several times as many species in a given system, even if it be as large as that of the Amazons, as a genus restricted to this system; and that a genus of narrow distribution has not a small number of species simply because there is room for no more.

The explanation is probably connected with the age of any given genus. Those genera with many species and wide distribution are evidently now at their prime, while those with wide distribution and few species, occupying isolate places are probably remnants from another age, and genera with few species and narrow distribution are very probably later differentiations. There are, of course, cases which will not be classified thus. *Callichthys* and *Hoplosternum* are cases in hand which have already been mentioned. *Platystoma* (List III) offers another instance, being composed of a single species distributed over nearly the whole of the region east of the Andes and north of Buenos Ayres.

Another fact worthy of mention, though not directly illustrated by these lists, is that the species of wide distribution belong to genera of many species and wide distribution. Genera of many species frequently have one or more species of wide distribution. On the other hand genera of few species and narrow distribution usually have species of restricted distribution.

The variability of species of wide distribution has already been mentioned.

We shall now take up the zoögeography more in detail. Too great stress must not be placed on our present knowledge; the details of the distribution of not one species is as yet worked out. The absence of certain genera from the Rio Magdalena and the Rio Plata is probably due to our lack of knowledge. The general results, however, will perhaps not vary greatly from what may be deduced from the present data.

A word as to the preparation of the lists. The entire catalogue was read and the genera (exclusive of marine) having similar geographical boundaries were placed together, the result obtained being presented in the foregoing lists. The regions covered by each list are, therefore, the necessary outcome of the facts. There are, naturally, a number of genera which can not be placed in any of the lists.

The first list gives the genera characterizing the Fuegian subregion of the southern zone. Although a few genera (*Chirodon*, *Pygidium*) have representatives here, its fauna is such as to separate it very distinctly from the neotropical realm and it is included here more for convenience than for its affinity with the rest of South America.

The second list, and the third and fourth with the exception of those genera found also in the Mexican subregion and so marked, present the genera which characterize the Brazilian subregion as a whole. A few of the genera have not been found in the Rio Plata and the Rio Magdalena.

The fifth list characterizes what may be termed the Pacific province of the Brazilian region. It includes the territory west of the Andes, between Costa Rica* and Peru.

* The Rio Chagres certainly does not belong to the Mexican subregion.

The validity of this province, as of all the others considered here, will become much more apparent if the number of peculiar species of other than peculiar genera (see List IV, foot-notes) are taken into account. Omitting alpine forms, such as *Pygidium*, the species, with few exceptions, are peculiar—the few excepted species being inhabitants of Central America, from where they have very probably emigrated. As several forms are now found on both the eastern and western slopes of Panama, the isthmus does not seem to be a barrier to the migration of fresh-water fishes at present, and many of the lowland species of eastern genera now inhabiting this province may, within comparatively recent time, have been derived from the east by way of Panama. That the mountains of Panama are a greater barrier than the ocean is clearly seen by noting the species found in the Rio Magdalena which are also found in some of the other eastern slope streams, but are not found in the Pacific province.

List VI would indicate that the Amazons and the region to the northward constitute a well marked subregion or a province. The validity of this province seems doubtful in the face of this seeming preponderance of evidence. The greater portion of the Paraña and Paraguay are unexplored, and it is tolerably safe to predict that many of the genera enumerated as peculiar to this province will be found in some portion of the La Plata system. The explorations of Natterer in the Cujaba fully warrant such a forecast. He found several Amazonian genera in this river which had not before been recorded from the La Plata system, many of which have not again been taken in its lower courses. Dr. D. S. Jordan* has lately called attention to the fact mentioned many years ago by Robert Schomburgk, that there is at times a connection between the Amazon and La Plata systems. Dr. Jordan says: "Prof. John C. Branner calls my attention to a marshy upland which separates the valley of the La Plata from that of the Amazon, and which permits the free movement of fishes from the Paraguay River to the Tapajos. It is well known that through the Cassiquiare River the Rio Negro, another branch of the Amazon, is joined to the Orinoco River. It is thus evident that almost all the waters of eastern South America form a single basin, so far as fishes are concerned."†

The large number of genera found in the Amazons and La Plata which do not occur in the rivers of southeastern Brazil (see List III) would lead one to conclude that the Amazonian genera reach the La Plata system directly, even if such connections as are known to exist were not known.

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* Science Sketches, 120, foot-note 1.

† The American Naturalist of April, 1888, contains the following: "M. Chaffanjon, the well known explorer of the Orinoco, has carefully studied the communication between that river and the Amazon, by means of the Cassiquiare, and comes to the conclusion that it is of recent origin. The rapid current of the Orinoco, as it passes through a gorge only 90 yards wide in the clay deposits, undermines the banks, and this action, combined with actual overflow in the rainy season, has produced a permanent channel. The clay deposits on the left bank have a slope towards the Amazon.

The Guianas present more faunal similarity to the Amazons than to the Orinoco, notwithstanding the fact that a direct connection between the Rio Negro and Cassiquiare exists. The anomaly may be explained by the comparative state of knowledge of the Orinoco and the Guianas, the former having received but little attention from explorers, while the Guianas—especially British Guiana—have been pretty well searched by many naturalists.

The genera of the Amazons (Lists VII, VIII, IX, X) are sufficient in number to warrant the separation of the Amazons, exclusive of the high mountain sources, as a distinct province, the Amazonian province. This province ought probably to include the Orinoco. As a convenience the genera are separated into four divisions, but many of Lists VIII to X will certainly be placed under the head of VII when the geographical limits become better known. Many of the genera enumerated under VII are known from only two portions of the large system, some being from the Amazon and Solimoens, others from the Solimoens and Marañon, and others from the Amazon and Marañon. The last combinations are again to be explained by our comparative lack of knowledge of the Solimoens fauna. There are also genera (as *Mesonauta*) found in the Amazon and the Guaporé under conditions which differ more than those between the Amazon and the Marañon. For the present, then, the whole of the Amazon basin may be considered as one province. The Amazon fauna presents many similarities to the Guiana fauna.

Lists XI to XIII show in a striking manner the paucity of peculiar generic types in the San Francisco, Guianas, and Magdalena regions and their *entire absence* in the Orinoco region. The comparatively large number of genera peculiar to the Guianas is doubtless due to the large number of isolated river systems which are yet too closely united to warrant a separation into distinct provinces. The absence of peculiar generic types in the Orinoco is probably due to our meager knowledge of that large river and to its direct connection with the Amazons.

The Rio Magdalena, considering its isolation and the fact that it lies entirely to the west of one of the highest northern Andean ridges, has remarkably few generic types peculiar to itself as well as a strikingly large number of species found in other eastern rivers. If we compare this with the paucity of identical types in the Pacific province and in the eastern provinces we have before us a self-evident proof that, within a certain limit, bodies of salt water present a much weaker barrier to the distribution of fresh-water fishes of South America than even a narrow and comparatively low mountain chain such as separates the Cauca from the Pacific province.

The Rio San Francisco has but two peculiar genera which are very closely related to genera of wide distribution. This can not be attributed to lack of knowledge, for, through the labors of Reinhardt, Lütken, and others, this river fauna has been as well made known as that of any other region. As will be seen from List VI, this river has several genera

found elsewhere only in the Amazons and northward. These are very probably late immigrants from the Amazon. This system may provisionally be set apart as the San Francisco province.

South of the Rio San Francisco is a province well marked both positively and negatively. Very many genera found to the north and to the south (see List III) have no representatives here, while a large number of genera are peculiar to the region. Its northern and southern limits can not yet be defined; roughly speaking, it includes all the Atlantic slopes of Minas Geraes, Bahia, and Rio de Janeiro. The chief river, and the one most thoroughly explored, is the Parahyba with its tributaries Muriahé and Rio Preto. Other rivers are the Itabapuana, Doce, Mucuri, Jequitinhonha, Pardo, Paraguassu.

The isolation of this province proves in a very decided manner that the large number of genera of the La Plata which are also found in the Amazons have not reached the La Plata by way of the sea. The region may be termed the Atlantic province.

The mountain streams of Colombia, Ecuador, Peru, and Bolivia are inhabited by a number of peculiar genera (XV) and a large number of peculiar species, especially of *Pygidium* and *Chætostomus*. The peculiarities are such that these mountain regions may readily be distinctly separated as the Andean province. The genera *Eremophilus* and *Astroblepus* ascribed to the Magdalena may belong to this province. Its boundaries are necessarily very irregular and as yet not well defined. Species of *Pygidium*, which are here especially abundant, are also found in the coast rivers of Peru and southward to Chili, thus forming an important portion of the Fuegian fauna. The most important body of water is Lake Titicaca and the headwaters of both the eastern and western slopes are included.

Of the La Plata province little need be said at this time. A very large part of it has not yet been explored. At present the province must be distinguished by its negative characters. The genus *Cochliodon* is so nearly related to Amazonian genera that it is of no great importance. The way in which Amazonian genera may enter the La Plata system has been pointed out above.

With the present data the Brazilian subregion may provisionally be divided into the following provinces: (1) Pacific, (2) Andean, (3) Magdalena, (4) Orinoco, (5) Guiana, (6) Amazonian, (7) San Franciscan, (8) Atlantic, (9) La Plata.

This account would not be complete without a few words in regard to Central America and Mexico. The latter may be dismissed with the statement that its northern half contains North American forms chiefly while its southern half has a large proportion of Central American forms. The Central American fauna consists of very few northern types, the great majority being modified representatives of South American forms. There does not exist at present a sufficient barrier to pre-

vent the ready intermingling of the two faunas. Wallace says on this subject:

The whole character of neotropical zoölogy, whether as regards its deficiencies or its specialties, points to a long continuance of isolation from the rest of the world, with a few very distant periods of union with the northern continent. The latest important separation took place by the submergence of parts of Nicaragua and Honduras, and this separation probably continued throughout much of the Miocene and Pliocene periods; but some time previous to the coming on of the glacial epoch, the union between the two continents took place which has continued to our day. Earlier submergences of the Isthmus of Panama probably occurred, isolating Costa Rica and Veragua, which then may have had a greater extension, and have thus been able to develop their rich and peculiar fauna.

The Isthmus of Tehuantepec, at the south of Mexico, may probably also have been submerged; thus isolating Guatemala and Yucatan, and leading to the specialization of some of the peculiar forms that now characterize those countries and Mexico.

EXPLANATIONS.

The species are numbered consecutively from first to last; the subspecies have added the letters a, b, c, etc., to the number of their respective species.

Species insufficiently described or doubtful for other reasons have their number followed by an interrogation point.

As far as possible with the present status of South American ichthyology the species of a genus have been grouped under their respective subgeneric names.

The families have been arranged, with slight modifications, after the system proposed by Cope and Gill. Those families and genera which have been reviewed by us have their genera and species arranged as in our Revisions. The genera and species of the other families have been arranged as in Günther's Catalogue of Fishes.

As in the A. O. U. Code and Check-list the name of each species and subspecies is followed by the name of the original describer inclosed in parentheses if it is not also the authority for the name adopted.

In selecting names we have tried to follow the canons of the A. O. U. Code implicitly in all cases but the following:

Canon XVII is to be modified to read: Between competitive, specific, or generic names published simultaneously in the same work preference is to be given to that which stands first in the book.

Canon XVIII is to be disregarded.

Canon XXV is made to read: A genus formed by the combination of two or more genera takes the name first given in a generic or subgeneric sense to either or any of its components.

After the name of the describer, is given the general habitat of the species. All the localities at which a species has been found have been compiled and on these notes the statement of the habitat of each species is based.

The habitat is followed in each case by a reference to some description of the species in question. If it is described in Dr. Günther's Cat-

alogue of Fishes only the letter G. with the volume and page are given. Later works are referred to more in full. Unless the first description of species discovered since Dr. Günther's catalogue was published was insufficient or published in some obscure journal it is referred to. In those families which have lately been revised the revisions only are referred to.

The habitat is in each case followed by the synonyms of the species as determined by us or by the latest works of other authors.

MARSIPOBRANCHII.

HYPEROARTIA.

I. PETROMYZONTIDÆ.

1. EXOMEGAS Gill.

1. E. macrostomus (Burmeister). Buenos Ayres. G., VIII, 506.

2. CARAGOLA Gray.

Mordacia Gray.

2. C. mordax (Richardson). Valparaiso. G., VIII, 507.
C. lapicida Gray; *Petromyzon anwandteri* and *acutidens* Philippi.

3. GEOTRIA Gray.

Velasia Gray.

3. G. chilensis (Gray). Chili. G., VIII, 509.

PISCES.

RAIÆ.*

II. TORPEDINIDÆ.

4. NARCINE Henle.

4. N. brasiliensis (Olfers). Atlantic coast of Tropical America, entering rivers. G., VIII, 453.
Torpedo bancroftii Griffith; *N. nigra* Dumeril; *Torpedo pictus* Gronow.

III. DASYBATIDÆ.

5. PARATRYGON A. Duméril.

Disceus Garman.

5. P. strongylopterus (Schomburgk). British Guiana. G., VIII, 476.

* The following species are recorded from the mouth of the La Plata: *Mustelus vulgaris* Müller and Henle: Günther; '80. *Raia platana* Günther; '80, a 11. *Raia microps* Günther; '80, a 12.

6, 7. POTAMOTRYGON Garman.

6. P. brachyurus Günther. La Plata. G., '80, 8.
7. P. hystrix Müller & Henle. Roawa; Rio Plata; Apuré; Orinoco; Rio Branco. G., '80, 7.
8. P. d'orbignyi Castlenau. Tocàntins; Orinoco near Ciudad, Bolivar. G., VIII, 484.
9. P. reticulatus Günther. La Plata; Surinam; Santarem. G., VIII, 482, as *T. hystrix*.
10. P. magdalenæ Steind. Rio Magdalena. Steind., '78, 56.
11. P. motoro Müller & Henle. Rio Cuyaba. G., VIII, 484.
    Trygon garrapa Schomburgk.
12. P. dumerilii Castlenau. Aragnay; Tocantins, Rio Crixas. G. VIII, 484.
    T. mülleri and *henlei* Castlenau.

8. ELLIPESURUS* Schomburgk.

13. E. spinicauda Schomburgk. Rio Branco, near Fort Joaquim. G., VIII, 472.

DIPNOI.

IV. LEPIDOSIRENIDÆ.

9. LEPIDOSIREN Fitzinger.

Amphibichthys Hogg.

14. L. paradoxa F. Madeira near Barba; Amazon near Villa Nova. G., VIII, 322.
    L. dissimilis Castelnau.

SYMBRANCHIA.

V. SYMBRANCHIDÆ.

10. SYMBRANCHUS Bloch.

Unibranchapertura Lacépède; *Ophisternon* McClelland; *Tetrabranchus* Bleeker.

15. S. marmoratus Bloch. Porto Alegre; Pernambuco; Amazons and northward. G., VIII.
    S. immaculatus Bloch; *S. transversalis* Bl. & Schn.; *Unibranchapertura grisea* Lacép.; *Unibranchapertura lineata* Lacép.; *S. fuliginosus* Ranzani; *Muræna lumbricus* Gronow; *S. vittatus* Castelnau.

NEMATOGNATHI.†

VI. ASPREDINIDÆ.

BUNOCEPHALINÆ.

11. BUNOCEPHALICHTHYS Bleeker.

16. B. hypsiurus (Kner). Rio Branco.

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* *Ellipesurus* is retained only provisionally. "*Ellipesurus spinicauda* of Schomburgk is probably a mutilated specimen of one of the varieties" of *P. Dumerilii*. See Garman, '78.

† The species of this order are described in A Revision of the South American Nematognathi E. and E., 1890, and no other references will be given to descriptions.

12. BUNOCEPHALUS Kner.

Aspredo Swainson.

17. B. scabriceps Eigenm. & Eigenm. Jutahy.
18. B. verrucosus (Bloch). Amazon.
19. B. gronovii Bleeker. Mouth of Rio Negro. Guiana.
20. B. bicolor Steindachner. Solimoens and Marañon.
21. B. melas Cope. Marañon.
22. B. knerii Steind. Solimoens and Marañon.
23. B. aleuropsis Cope. Marañon.

13. DYSICHTHYS Cope.

24. D. coracoideus Cope. Marañon (Nauta).

ASPREDININÆ.

14. ASPREDO Scopoli.

Platystacus Bloch. *Aspredo* Bleeker, *not* Swainson. *Cotylephorus* Swainson.

§ *Platystacus* Bloch.

25. A. cotylephorus Bloch. Surinam; Rio Para.
S. hexadactylus Lacép.; *A. sex-cirrhis* C. & V.; *A. spectrum* Gronow.
26. A. nematophorus Bleeker. Surinam.

§ *Aspredo* Scopoli.

27. A. aspredo (Linnæus). Guiana; Rio Para; Lake Arary.
Plœvis Bloch; *A. batrachus* L.
28. A. sicuephorus Cuv. & Val. French Guiana.
29. A. filamentosus Cuv. & Val. Guianas.

§ *Aspredinichthys* Bleeker.

30. A. tibicen (Temminck). Surinam; Brit. Guiana; Curuca, Rio Muria.

VII. DIPLOMYSTIDÆ.

15. DIPLOMYSTES Bleeker.

31. D. papillosus (Cuv. & Val.). Central Chili.
A. carcharias Leybold; *A. villosus, squalus, micropterus, synodon* Philippi.

VIII. SILURIDÆ.

TACHISURINÆ.

16. PARADIPLOMYSTES Bleeker.

32. P. coruscans (Lichtenstein) habitat?

17. GENIDENS Castlenau.

33. G. genidens (Cuv. & Val.). La Plata; Aragnay.
G. cuvieri Castlenau; *G. granulosus* Castlenau.

18. TACHISURUS Lacépède.

Bagrus, Arius Cuv. & Val.; *Sciades, Ariodes* Müller & Troschel; *Cephalocassis, Guiratinga, Selenaspis, Hemiarius, Pseudarius* Bleeker; *Notarius* Gill.

34. **T. albicans** (Cuv. & Val.). Amazon. Enters rivers.
B. valenciennesi Castlenau.

35. **T. herzbergii** (Bloch). Para. Enters rivers.
P. argenteus Lacépède; *B. pemecus* Cuv. & Val.; *B. cœlestinus* M. & T.; *H. hymenorhinus* Bleeker.

36. **T. upsilonophorus** (Eigenm. & Eigenm.). Rio Grande do Sul.

37. **T. barbus** (Lacépède). Montevideo; Guahyba; Rio Grande do Sul; Rio Parahyba; Rio Doce; Araguay.
P. commersoni Lac.; *B. barbatus* Quoy & Gaimard; *P. versicolor* Castlenau.

38. **T. grandoculis** (Steind.). Rio Doce.

39. **T. agassizii** Eigenm. & Eigenm. Rio Grande do Sul.

40. **T. spixii** (Agassiz). Para, Cayenne, Surinam. Enters rivers.
P. albidus Spix; *A. arenatus* Cuv. & Val.; *A. laticeps* Günther.

41. **T. multiradiatus** Günther. Rio Bayano, Panama.

CALLOPHYSINÆ.

19. CALLOPHYSUS Müller & Troschel.

Pimelotropis Gill; *Pseudocallophysus* Bleeker.

42. **C. macropterus** (Lichtenstein). Amazon; Solimoens, Marañon, and northward.
P. ctenodus Agassiz; *P. insignis* Schomb.; *P. lateralis* Gill.

PIMELODINÆ.

20. PIMELODINA Steind.

43. **P. flavipinnis** Steind. Para.

44. **P. nasus** Eigenm. & Eigenm. Para.

21. PINIRAMPUS Bleeker.

45. **P. pirinampu** (Spix). Rio Tocantins to Venezuela.
P. typus Bleeker; *? P. barbancho* Humboldt.

22. LUCIOPIMELODUS Eigenm. & Eigenm.

46. **L. pati** (Val.). Rio Plata; Rio Branco.

47. **L. platanus** (Günther). Rio Plata.

23. PSEUDOPIMELODUS Bleeker

Zungaro Bleeker.

§ *Lophiosilurus* Steind.

48. **Ps. alexandri** Steind. Rio San Francisco.

§ *Batrachoglanis* Gill.

49. **Ps. parahybæ** Steind. Rio Parahyba to Rio Doce.

50. **Ps. raninus** (Cuv. & Val.). Rio Janeiro to Essequibo; Huallaga; Matto Grosso.

51. **Ps. pulcher** Boulenger. Eastern Ecuador.
§ *Pseudopimelodus* Bleeker.

52. Ps. zunigaro (Humboldt). Rio Plata to Rio Magdalena.
P. bufonius Cuv. & Val.; *P. charus* Cuv. & Val.; *P. mangurus* Val.; *Z. humboldtii* Bleeker.

53. Ps. acanthochira Eigenm. & Eigenm. Amazon; Solimoens.

24. RHAMDIA Bleeker.

Pteronotus Swainson; *Pimelonotus* Gill; *Notoglanis* Günther.

54. ? R. velifer (Humboldt). Magdalena.

55. ? R. argentinus (Humboldt). Magdalena near Chilloa.

56. ? R. laukidi Bleeker. Guiana.

57. ? R. grunniens (Humboldt). Orinoco.

58. R. breviceps Kner. Marabitanos.

59. R. schomburgkii Bleeker. Brazil, Guiana.

60. R. bathyurus (Cope). Marañon.

61. R. obesa Eigenm. & Eigenm. Teffé.

62. R. sebæ (Cuv. & Val). Rio Janeiro to Rio Magdalena; Amazon; Solimoens.
P. stegelichii M. & T.; *P. musculus* M. & T.; *P. holomelas* Günther; *P. müllери* Günther.

63. R. sebæ kneri (Steind.). Amazon, Solimoens, and northward.

64. R. foina (M. & T). Takutu, Guiana.

65. R. humilis (Günther). Marañon; Venezuela.

66. R. cinerascens (Günther). Guayaquil; Esmeraldas.

67. R. pentlandi (Cuv. & Val.). Titicaca; Monterico; Tullumayo; Rio de Huambo.

68. R. quelen (Quoy & Gaimard). La Plata to Amazon.
Pimelodus sellonis Müller & Troschel; ? *Pimelodus bahianus* Castelnau; *Silurus sapipoca* Natterer; *Pimelodus wuchereri* Günther; *Pimelodus queleni cuprea* Steind.; *Pimelodus cuyabæ* Steindachner.

69. R. multiradiatus (Kner). Amazon; Solimoens; Madeira; Essequibo.
Pimelodus arekaima Schomburgk, description, not plate.

70. R. sapo (Val.). Rio Plata; southern Brazil.

71. R. hilarii (Cuv. & Val.). Rio San Francisco to La Plata.

72. R. wagneri (Günther). East and west slopes of Panama and Central America.
Pimelodus cinerascens Kner & Steind. (not Günther); *Rhamdia bransfordii* Gill.

73. R. longicauda Boulenger. Canelos.

74. R. dorsalis Gill. Marañon.

75. R. poeyi Eigenm. & Eigenm. Goyaz.

76. R. tenella Eigenm. & Eigenm. Cudajas.

25. RHAMDELLA Eigenm. & Eigenm.

77. R. microcephala (Reinhardt). Rio das Velhas.

78. R. notata (Schomburgk). Rio Branco.

79. R. eriarcha Eigenm. & Eigenm. Rio Grande do Sul.

80. R. exsudans (Jenyns). Rio Janeiro.

81. R. jenynsii (Günther). Rio Janeiro; Maldonado.
Pimelodus gracilis Jenyns (not Val.).

82. R. minuta Lütken. Macacos; Rio das Velhas; Rio de Janeiro.

26. HEPTAPTERUS Bleeker.

83. H. mustelinus (Val.). Rio Grande do Sul; Rio Plata.

27. ACENTRONICHTHYS Eigenm. & Eigenm.

84. A leptos Eigenm. & Eigenm. Sao Mateos.

85. A. surinamensis (Bleeker). Surinam.

86. A. collettii (Steind.). Rio Plata.

28. NANNOGLANIS Boulenger.

87. N. fasciatus Boulenger. Ecuador.

29. PIMELODELLA Eigenm. & Eigenm.

88. P. cristatus (Müller & Troschel). Rivers north of Cape San Roque.
Pimelodus insignis Schomburgk, description, not plate; *Pimelodus agassizii* Steindachner; *Pimelodus opthalmicus* Cope.

89. P. wesselii (Steind.). Rio Puty to Essequibo; Amazon.

90. P. gracilis (Valenciennes). La Plata to Orinoco.

91. P. pectinifer Eigenm. & Eigenm. Rio Parahyba.

92. P. modestus (Günther). Western Ecuador; eastern Panama.

93. P. elongatus (Günther). Western Ecuador.

94. P. lateristriga (Müller & Troschel). North of Rio Parahyba.

95. P. harttii (Steind.). Rio Parahyba.

96. P. buckleyi (Boulenger). Rio Parahyba; Amazon; Marañon.

97. P. vittata (Kröyer). Atlantic slopes of Minas Geraes and Bahia.

98. P. chagresi (Steind.). Rio Chagres.

99. P. brasiliensis (Steind.) Rio Parahyba.

30. PIMELODUS Lacépède.

Pseudariodes Bleeker; *Pseudorhamdia* Bleeker.

100. P. cyanostigma (Cope). Pebas, Ecuador.

101. P. quadrimaculatus (Bloch). ? America.

102. P. eques Müller & Troschel. Amazon, Solimoens, and northward.

103. P. ornatus Kner. Amazon, Solimoens, and northward.
Silurus megacephalus Natterer.

104. P. albicans (Cuv. & Val.). Rio Plata.
Arius albidus Val.; *Arius moroti* Val.

105. P. pictus Steind. Marañon.

106. P. clarias (Bloch). Rio Plata to Rio Magdalena.
Pimelodus maculatus Lacépède; *Pimelodus rigidus* Spix; *Pimelodus blochii* Cuv. & Val.; *Pimelodus areckaima* Schomburgk (plate, not description); *Mystus aseita* Gronow; *Pimelodus macronema* Bleeker; *Pseudariodes albicans* Lütken; ? *Pseudariodes pantherinus* Lütken; *Pseudorhamdia piscatrix* Cope; *Piramutana macrospila* Günther.

107. P. grosskopfii Steind. Rio Magdalena and tributaries.

108. P. labrosus Kröyer. La Plata.

109. P. valenciennis Kröyer. Rio Plata.

110. P. westermanni Reinhardt. Rio das Velhas.

111. P. altipinnis Steind. Amazon; Demarara.

112. P. fur Reinhardt. Amazon; Rio Negro; Rio San Francisco.
Pimelodus microstomus Steind.

31. Nov.?

113. Pirinampus agassizii Steind. Amazon; Marañon.

32. CONORHYNCHOS Bleeker.

§ *Conorhynchos.*

114. C. conirostris (Cuv. & Val.). Rio San Francisco.

§ *Nov.* ?

115. C. glaber Steind. Porto Segnro.

33. BAGROPSIS Lütken.

116. B. reinhardti Lütken. Rio das Velhas.

34. PIRAMUTANA Bleeker.

117. P. piramuta (Kner). Amazon; Solimoens; Rio Negro; Rio Madeira.

35. PLATYNEMATICHTHYS Bleeker.

118. P. punctulatus (Kner). Amazon, Solimoens, and tributaries.
Bagrus nigripunctatus Kner.

119. P. araguayensis (Castelnau). Araguay.

36. PHRACTOCEPHALUS Agassiz.

120. P. hemiliopterus (Bloch & Schneider). Amazon, Solimoens, Marañon, their tributaries, and northward.
Phractocephalus bicolor Agassiz.

37. SCIADES Müller & Troschel.

Leiarius & Sciadeichthys Bleeker.

§ *Sciades* M. & T.

121. S. pictus M. & T. Amazon and tributaries.

§ *Sciadeoides* Eigenm. & Eigenm.

122. S. marmoratus Gill. Marañon.

38. NEMUROGLANIS Eigenm. & Eigenm.

123. N. lanceolatus Eigenm. & Eigenm. Jutahy.

39. BRACHYPLATYSTOMA Bleeker.

Piratinga Bleeker; *Malacobagrus* Bleeker.

124. B. filamentosus (Lichtenstein). Brazil.

125. B. vaillanti Cuv. & Val. Eastern slopes of South America north of Rio Parahyba.
P. affine (Cuv. & Val.); *P. mucosa* Vaillant; *P. verruconum* Boulenger.

126. B. reticulatum (Kner). Rio Tocantins; Amazon and tributaries; Rio Madeira.

127. B. rousseauxii (Castlenau). Amazon.
B. goliath Heckel.

40. DUOPALATINUS Eigenm. & Eigenm.

128. D. emarginatus (Cuv. & Val.). Rio San Francisco.

41. Nov.?

129. Platystoma lütkeni Steind. Amazon.

42. STEINDACHNERIA Eigenm. & Eigenm.

130. St. amblyura Eigenm. & Eigenm. Rio Jequitinhonha.

131. St. doceana Eigenm. & Eigenm. Rio Doce.

132. St. parahybæ Steind. Rio Parahyba.

43. HEMISORUBIM Bleeker.

133. H. platyrhynchos (Cuv. & Val.). Orinoco; Amazons; Paranahyba.

44. PSEUDOPLATYSTOMA Bleeker.

Hemiplatystoma Bleeker.

134. Ps. fasciatum (Linnæus). Amazons and northward.
? Pl. truncatum Agassiz; *Pl. punctifer* Castlenau.

134a. Ps. f. nigricans Eigenm. & Eigenm. Xingu.

134b. Ps. f. brevifile Eigenm. & Eigenm. Goyaz.

134c. Ps. f. intermedium Eigenm. & Eigenm. Obidos; Rio Puty.

134d. Ps. f. reticulatum Eigenm. & Eigenm. Rio Negro.

135. Ps. tigrinum (Cuv. & Val.). Amazons; Guiana.

136. Ps. coruscans (Agassiz). Rio San Francisco; La Plata.
Sorubim caparary Spix; *Platystoma pardalis* Val.; *Platystoma punctatum* Cuv. & Val.; *Platystoma orbignianum* Val.; *Platystoma forschhammeri* Reinhardt.

45. SORUBIM Spix.

Platystoma Agassiz.

137. S. lima (Bloch & Schneider). Rio Plata; Amazons and tributaries; Orinoco; Magdalena.
Sorubim infraocularis Spix; *Platystoma lucceri* Weyenbergh.

46. SORUBIMICHTHYS Bleeker.

138. S. planiceps (Agassiz). Amazons; Orinoco.
Sorubim piranaca Spix; *Platystoma artedii* Günther; *Sorubimichthys ortoni* Gill.

139. S. spatula (Agassiz). ? Amazon.
Sorubim jandia Spix.

140. S. gigas (Günther). Huallaga.

47. PLATYSTOMATICHTHYS Bleeker.

141. P. sturio (Kner). Amazon and tributaries.

DORADINÆ.

48. PHYSOPYXIS Cope.

142. P. lyra Cope. Ambyiacu.

49. DORAS Laecépède.

Centrochir Agassiz; *Lithodoras, Pterodoras, Platydoras, Acanthodoras, Astrodoras & Amblydoras* Bleeker; *Zathorax & Agamyxis* Cope.

§ *Lithodoras* Bleeker.

143. D. dorsalis Cuv. & Val. Para; Rio Negro; Cayenne.
Doras papilionatus Filippi; Doras lithogaster Heekel.

§ *Doras* Laecépède.

144. D. uranoscopus Eigenm. & Eigenm. Lake Hyannary.

145. D. maculatus Val. Rio Plata; Amazon; Demarara.
? Doras granulosus Val.; *Doras murica* Natterer.

146. D. longipinis Steind. Rio Magdalena.
? Doras crocodili Humboldt.

147. D. albomaculatus Peters. Calabozo.

148. D. helicophilus Günther. Surinam.

149. D. dentatus Kner. Surinam.

150. D. costatus (Linnæus). Rio San Francisco; Amazon; Solimoens; Guiana region.

151. D. armatulus Cuv. & Val. Upper courses of Brazilian rivers; Venezuela.

152. D. hancockii Cuv. & Val. Cupai.

153. D. brachiatus Cope. Marañon.

§ *Acanthodoras* Bleeker.

154. D. calderonensis Vaillant. Lago Alexo; Calderon.
Doras depressus Steind.

155. D. cataphractus (Linnæus). Central Brazil; Guiana.
Cataphractus americanus Bloch & Schneider; *Doras blochii* Cuv. & Val.; *? Doras brunnescens* Schomburgk; *Doras polyramma and polygramma* Heckel; *Callichthys asper* Gronow.

156. D. spinosissimus Eigenm. & Eigenm. Coary.

157. D. marmoratus Reinhardt. Rio San Francisco

§ *Amblydoras* Bleeker.

158. D. affinis Kner. Rio Branco; Rio Guapore.
Doras truncatus Bleeker.

159. D. weddellii Castlenau. Amazons.
Doras grypus Cope.

§ *Centrochir* Agassiz.

160. D. crocodili Humboldt. Rio Magdalena.

§ *Agamyxis* Cope.

161. D. castaneo-ventris Schomburgk. Passawiri.

162. D. pectinifrons Cope. Pebas, Ecuador.

§ *Astrodoras* Bleeker.

163. D. asterifrons Heckel. Amazon, Solimoens, and tributaries.

164. D. heckelii Kner. Solimoens.

165. D. monitor Cope. Amazon.

166. D. nauticus Cope. Marañon.

50. OXYDORAS Kner.

Pseudodoras and *Rhinodoras* Bleeker.

§ *Oxydoras* Kner.

167. O. niger (Val.). Amazonas and northward; Rio San Francisco.
Doras humboldti Agassiz; *Corydoras edentatus* Spix; *Rhinodoras prionomus* Cope; *Rhinodoras teffeanus* Steind.

168. O. knerii Bleeker. Cujaba.

§ *Rhinodoras* Bleeker.

169. O. d'orbigny Kröyer. La Plata.

170. O. amazonum (Steind.). Teffe.

51. HEMIDORAS Bleeker.

§ *Hemidoras* Bleeker.

171. H. nattereri (Steind.). Solimoens.

172. H. brevis (Kner). Barra do Rio Negro; Calderon.

173. H. fimbriatus (Kner). Rio Guapore.

174. H. punctatus (Kner). Rio Guapore.

175. H. lipophthalmus (Kner). Rio Negro; Rio Capin.

176. H. accipenserinus (Günther). Xeberos.

177. H. stenopeltis (Kner). Amazon; Solimoens.

178. H. stübelii (Steind.). Huallaga.

179. H. morei (Steind.). Rio Negro.

180. H. humeralis (Kner). Rio Negro.

181. H. carinatus (Linnæus). Calderon; Surinam; Cayenne; Essequibo.
Doras oxyrhynchus Val.

§ *Hassar* Eigenm. & Eigenm.

182. H. orestes (Steind.). Xingu; Jutahy.

183. H. affinis (Steind.). Rio Puty.

AUCHENIPTERINÆ.

52. ASTEROPHYSUS Kner.

184. A. batrachus Kner. Marabitanos.

53. TRACHELYOPTERICHTHYS Bleeker

185. T. tæniatus Kner. Solimoens and tributaries.

54. TRACHELYOPTERUS Cuv. & Val.

186. T. coriaceus Cuv. & Val. Amazon; Cayenne.

186*a*. T. c. maculosus Eigenm. & Eigenm. Porto do Moz.

55. WERTHEIMERIA Steind.

187. W. maculata Steind. Jequitinhonha.

56. CENTROMOCHLUS Kner.

187½. Arius oncina Schomburgk. Rio Padauiri.

188. C. heckelii (Filippi). Amazonas and tributaries.
Centromochlus megalops Kner.

189. C. steindachneri Gill. Marañon.

190. C. intermedius Steind. Amazon; Solimoens and tributaries.

191. C. perugiæ Steind. Canelos.

192. C. aulopygius Kner. Rio Guapore; Cudajas; Essequibo.

56½. GLANIDIUM Lütken.

193. G. albescens Lütken. Coast streams from Rio Janeiro to the Amazon.

57. TRACHYCORYSTES Bleeker.

194. T. glaber (Steind.). Demarara.

195. T. isacanthus (Cope). Marañon.

196. T. insignis (Steind.). Magdalena.

197. T. obscurus (Günther). Essequibo.

198. T. magdalenæ (Steind.). Magdalena.

199. T. trachycorystes (Cuv. & Val.). ?
Trachycorystes typus Bleeker.

200. T. ceratophysus (Kner). Guapore; Rio Negro and Branco.

201. T. porosus Eigenm. & Eigenm. Brazil.

202. T. striatulus Steind. Mouths of rivers draining eastern Minas Geraes; Para.

203. T. brevibarbus (Cope). Marañon.

204. T. galeatus (Linnæus). Rio das Velhas to the Orinoco.
Auchenipterus maculosus, immaculatus and *punctatus* Cuv. & Val. *Auchenipterus lacustris* Lütken.

205. T. robustus Günther. Demarara.

206. T. analis Eigenm. & Eigenm. ? Arary.

58. AUCHENIPTERICHTHYS Bleeker.

207. A. thoracatus (Kner). Solimoens and tributaries.

208. A. longimanus (Günther). Southern tributaries of the Amazon.

59. PSEUDAUCHENIPTERUS Bleeker.*

209. Ps. jequitinhonhæ (Steind.). Jequitinhonha.

210. Ps. flavescens Eigenm. & Eigenm. Rio San Francisco.

211. Ps. affinis (Steind.). Para; mouths of streams draining eastern Minas Geraes.

212. Ps. nodosus Bloch. Bahia; Para; Guiana.
A. furcatus Cuv. & Val.

60. EPAPTERUS Cope.

213. E. dispilurus Cope. Hyavary; Marañon.
Euanemus longipinnis Steind.

* Gill, Proceeding National Museum, Vol. XIII, p. 353; E. & E., p. 285.

61. AUCHENIPTERUS Cuv. & Val.

Euanemus M. & T.

214. A. nuchalis (Spix). Amazonas; Surinam.
A. dentatus Cuv. & Val.; *E. colymbetes* M. & T.

215. A. fordicei Eigenm. & Eigenm. Coary.

216. A. brachyurus (Cope). Peru.

62. TETRANEMATICHTHYS Bleeker.

217. T. quadrifilis (Kner). Rio Guapore.

AGENEIOSINÆ.

63. AGENEIOSUS Lacépède.

Ceratorhynchus Agassiz; *Hypothalmus* Schomburgk; *Pseudageneiosus* and *Davalla* Bleeker; *Ageniosus* Günther.

218. A. inermis (Linnaeus). Surinam.

§ *Ageneiosus* Lacépède.

219. A. brevis Steind. Solimoens; Coary.

220. A. atronasus Eigenm. & Eigenm. ? Brazil.

221. A. valenciennesi Bleeker. La Plata to Rio Puty.

222. A. armatus Lacépède. Surinam.

223. A. ucayalensis Castelnau. Para; Ucayale.

224. A. caucanus Steind. Cauca.

225. A. dentatus Kner. Amazon; Solimoens; to Guiana and Rio Magdalena.
Ageneiosus pardalis Lütken.

226. A. porphyreus Cope. Surinam.

227. A. dawalla (Schomburgk). Amazon; Guiana.
Ageneiosus inermis Cuv. & Val., not of Bloch; *Ageneiosus sebæ* Günther.

§ *Pseudageneiosus* Bleeker.

228. A. brevifilis Cuv. & Val. Amazons; Guiana; Upper Paraguay.

229. A. axillaris Günther. Surinam.

IX. HYPOPHTHALMIDÆ.

64. HELOGENES Günther.

230. H. marmoratus Günther. Essequibo.

65. HYPOPHTHALMUS Spix.

Notophthalmus Hyrtl; *Pseudohypophthalmus* Bleeker.

231. H. edentatus Spix. Amazons and tributaries, and northward.
Hypophthalmus marginatus, H. longifilis, and *H. spixii* Cuv. & Val. *Hypophthalmus edentulus* Castelnau; *Hypophthalmus fimbriatus* Kner; *Hypophthalmus perporosus* Cope.

X. PYGIDIDÆ.

CETOPSINÆ.

66. CETOPSIS Agassiz.

§ *Hemicetopsis* Bleeker.

232. C. candiru (Spix). Rio Cupai to Rio Huallaga.
233. C. plumbeus Steind. Canelos.

§ *Cetopsis* Agassiz.

234. C. cœcutiens (Lichtenstein). Amazon from Gurupa to Rio Cupai.

§ *Pseudocetopsis* Bleeker.

235. C. gobioides Kner. Irisanga.

§ *Subgen. nov.?*

236. C. occidentalis Steind. Guayaquil.
237. C. ventralis Gill. Marañon.

PYGIDIINÆ.

67. NEMATOGENYS Girard.

238. N. inermis (Guichenot). Fresh waters of Central Chili.
N. nigricans and *pallidus* Philippi.

68. PARIOLIUS Cope.

239. P. armillatus Cope. Ambyiacu.

69. PYGIDIUM Meyen.

240. ? P. fuscum Meyen. Peru.
241. ? P. palleum (Philippi). Chili.
242. ? P. marmoratum (Philippi). Chili.
243. ? P. tenue (Weyenbergh). Sierra de Cordoba near Cruz-de-eje.
244. ? P. corduvense (Weyenbergh). Rio Primero.
245. ? P. tigrinum (Philippi). Chili.
246. P. macræi (Girard). Uspullata.
247. P. maculatum (Cuv. & Val.). Western slopes of Central Chili.
248. P. areolatum (Cuv. & Val.). Western slopes of Central Chili.
249. P. rivulatum (Cuv. & Val.). Titicaca; Ucayale and tributaries.
T. inca, gracilis, barbatula Cuv. & Val.; *T. pentlandi, pictus* Castelnau.
250. P. poeyanum (Cope). Western slopes of southern Peru.
251. P. brasiliense (Reinhardt). Rio Janeiro to Rio San Francisco.
252. P. tænia (Kner). Western slopes of Peruvian Andes.
253. P. laticeps (Kner). Western slopes of the Peruvian Andes.
254. P. oroyæ Eigenm. & Eigenm. Oroya River.
255. P. punctatissimum (Castelnau). Aragnay.
256. P. knerii (Steind.). Eastern slopes of Ecuador; Cumbaca.
257. P. dispar (Tschudi.). Eastern and western slopes of Peruvian Andes.
258. P. d. punctulatum (Cuv. & Val.). Western slopes of Peruvian Andes.

259. P. nigromaculatum (Boulenger). Colombia.

260. P. pardus (Cope). Jequetepeque; Callao Bay.

261. P. immaculatum Eigenm. & Eigenm. Juiz de Fora; Sao Matheos; Goyaz.

262. P. taczanowskii (Steind.). Rio de Huambo; Rio de Tortora.

263. P. nigricans (Cuv. & Val.). Santa Catherina.

264. P. amazonicum (Steind.). Cudajas.

70. EREMOPHILUS Humboldt.

Thricomycterus Humb.; *Trachypoma* Giebel.

265. E. mutisii Humboldt. Rio Magdalena.
T. marmoratum Giebel.

71. TRIDENS Eigenm. & Eigenm.

266. T. melanops Eigenm. & Eigenm. Iça.

267. T. brevis Eigenm. & Eigenm. Tabatinga.

STEGOPHILINÆ.

72. PSEUDOSTEGOPHILUS Eigenm. & Eigenm

268. P. nemurus (Günther). Marañon.

73. STEGOPHILUS Reinhardt.

269. S. maculatus Steind. La Plata.

270. S. punctatus Boulenger. Canelos.

271. S. intermedius Eigenm. & Eigenm. Goyaz.

272. S. macrops Steind. L. Manacapuru.

273. S. insidiosus Reinhardt. Rio das Velhas.

274. S. reinhardti Steind. Solimoens and tributaries.

74. VANDELLIA Cuv. & Val.

275. V. cirrhosa Cuv. & Val. Hyavary.

276. V. plazaii Castelnau. Lake Hyanuary; Calderon; Ucayale.

75. PAREIODON Kner.

Centrophorus Kner; *Astemomycterus* Guichenot.

277. P. microps Kner. Amazons; Arugnay; Ambyiacu.

278. T. pusillus Castelnau.

76. MIUROGLANIS Eigenm. & Eigenm.

279. M. platycephalus Eigenm. & Eigenm. Jutahy.

XI. ARGIIDÆ.

77. ARGES Cuv. & Val.

Brontes Cuv. & Val.

280. A. sabalo Cuv. & Val. Peruvian Andes and Cordilleras.

281. A. prenadilla Cuv. & Val. Peruvian Andes.
A. brachycephalus Günther.

282. A. longifilis Steind. Rio Huambo.

283. A. peruanus Steind. Peruvian Andes.

283½. A. whymperi Boulenger.*

284. A. taczanowskii Boulenger.*

78. CYCLOPIUM Swainson.

Stygogenes Günther.

285. C. cyclopum (Humboldt). Andes of Ecuador.
C. humboldti Swainson; *St. humboldti* Günther.

286. C. güntheri Boulenger. Colombia.

79. ASTROBLEPUS Humboldt.

287. A. grixalvii Humboldt. Rio Magdalena system.

XII. LORICARIIDÆ.

LORICARIINÆ.

80. FARLOWELLA Eigenm. & Eigenm.

Acestra Kner. Preoccupied in Hem.

288. F. gladiola (Günther). Rio Cupai.

289. F. carinata Garman. Amazon; Solimoens.

290. F. knerii (Steind.). Ucayale and Pastasa Rivers.

291. F. oxyrhynchus (Kner). Rio Mamore.

292. F. amazona (Günther). Santarem.

293. F. acus (Kner). Caracas.
? *L. scolopacina* Filippi.

81. HEMIODONTICHTHYS Bleeker.

294. H. acipenserinus (Kner). Solimoens; Marañon and tributaries.

82. LORICARIA Linnæus.

Hemiloricaria; Oxyloricaria Bleeker.

295. ? L. platyura M. & T. Rupununi.

296. ? L. caracasensis (Bleeker). Caracas.

297. ? L. bransfordi Gill. Panama.

298. ? L. cadeæ Heusel. Rio Cadea.

§ *Hemiodon* Kner.

299. L. depressa (Kner). Rio Negro.

300. L. panamensis Eigenm. & Eigenm. Panama.

§ *Sturisoma* Swainson.

301. L. rostrata Spix. Cujaba; Solimoens; Marañon; Calabozo; Panama.
L. acuta Cuv. & Val., plate; *L. barbata* Kner.

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* The two species, 283½ and 284, have been described by Mr. Boulenger in an article received since the transmission of this catalogue for publication. (See Proc. Zool. Soc. London, 1890, pp. 450, 451.)

§ *Rineloricaria* Bleeker.

302. **L. brevirostris** Eigenm. & Eigenm. Iça.

303. **L. lima** Kner. Rio Parahyba to Para; Atlantic and Pacific slopes of Panama.
L. strigilata Hensel.

304. **L. magdalenæ** Steind. Magdalena.

305. **L. filamentosa** Steind. Canelos, Magdalena.

306. **L. brunnea** Hancock. Demarara.

§ *Pseudohemiodon* Bleeker.

307. **L. platycephala** (Kner). Rio Cujaba.

§ *Parahemiodon* Bleeker.

308. **L. uracantha** Kner & Steind. Eastern and western slopes of Panama.

309. **L. stübelii** Steind. Amazons; Rio Preto; Rio Puty.

310. **L. spixii** Steind. Southeastern Brazil.

311. **L. typus** (Bleeker). Surinam.
L. hemiodon Günther.

312. **L. phoxocephala** Eigenm. & Eigenm. Coary.

313. **L. anus** Valenciennes. La Plata; Rio Grande do Sul.

§ *Loricariichthys* Bleeker.

314. **L. acuta** Cuv. & Val. Amazons.
? L. castanea Castelnau; *L. maculata* Günther.

315. **L. maculata** Bloch. Rio Guapore; Calderon; Surinam.

316. **L. konopickyi** Steind. Amazon; Calderon.
L. valenciennesi Vaillant.

317. **L. lanceolata** Günther. Xeberos; Canelos.

318. **L. teffeana** Steind. Solimoens.

§ *Pseudoloricaria* Bleeker.

319. **L. lævinscula** Cuv. & Val. Amazon; Solimoens and tributaries.

§ *Loricaria* Linnæus.

320. **L. variegata** Steind. Mamoni River.

321. **L. macrodon** Kner. Cujaba.

322. **L. nudiventris** Cuv. & Val. Rio San Francisco.
L. dura L.; *L. cirrhosa* Bl. & Sch.; *L. setifera*; *L. carinata* Castelnau; *P. flagellaris* Gronow.

323. **L. cataphracta** Linnæus. Rio Preto; Amazons; Guiana.

324. **L. lata** Eigenm. & Eigenm. Goyaz.

325. **L. macromystax** Günther. Marañon.

326. **L. vetula** Valenciennes. Buenos Ayres.

327. **L. lamina** Günther. Xeberos.

328. **L. platystoma** Günther. Surinam.

83. HARTTIA Steind.

329. H. loricariformis Steind. Southeastern Brazil.

84. OXYROPSIS Eigenm. & Eigenm.

330. O. wrightii Eigenm. & Eigenm. Lake Hyanuary.

HYPOPTOMINÆ.

85. HYPOPTOPOMA Günther.

331. H. thoracatum Günther. Solimoens, Marañon, and northward.
H. bilobatum Cope; *Otocinclus joberti* Vaillant.

332. H. gulare Cope. Marañon.

333. H. carinatum Steind. Solimoens near Peruvian Amazon.

86. HISONOTUS Eigenm. & Eigenm.

334. H. notatus Eigenm. & Eigenm. Santa Cruz; Juiz de Fora.

87. PAROTOCINCLUS Eigenm. & Eigenm.

335. P. maculicauda (Steind.). Santa Cruz.

88. OTOCINCLUS Cope.

336. O. affinis Steind. Santa Cruz near Rio de Janeiro.

337. O. vestitus Cope. Ambyiacu.

PLECOSTOMINÆ.

88½. MICROLEPIDGASTER Eigenm. & Eigenm.

338. M. perforatus Eigenm. & Eigenm.

89. NEOPLECOSTOMUS Eigenm. & Eigenm.

339. N. granosus (Cuv. & Val.). Cayenne.

340. N. microps (Steind.). Rio Janeiro; Rio Parahyba; Goyaz.

90. PLECOSTOMUS Gronow.

Hypostomus Lacépède.

341. P. emarginatus Cuv. & Val. Amazons and tributaries; Guianas; Magdalena.
H. horridus Kner; *H. squalinum* Schomb.; *P. scapularius* Cope; *P. tenuicauda* Steind.

342. P. spinosissimus Steind. Rivers near Guayaquil.

344. P. commersonii (Val.). Southeastern Brazil; Rio Plata and tributaries.
H. punctatus Cuv. & Val.; *H. subcarinatus* Castelnau; *Pl. spiniger* Hensel.

344a. P. commersonii scabriceps Eigenm. & Eigenm. Sao Matheos.

344b. P. commersonii affinis Steind. Southeastern Brazil.

345. P. limosus Eigenm. & Eigenm. Rio Grande do Sul.

346. P. carinatus Steind. Amazons.

347. P. plecostomus (Linnæus). Rio Puty; Amazons and northward.
H. guacari Lacépède; *L. flava* Shaw; *H. veres* Cuv. & Val.; *Pl. bicirrhosus* Gronow; *Pl. brasiliensis* Bl.

348. P. vaillanti Steind. East central Brazil.
349. P. villarsi Lütken. Caracas.
350. P. virescens Cope. Marañon.
351. P. biseriatus Cope. Amazon.
352. P. seminudus Eigenm. & Eigenm. ? Brazil.
353. P. annæ Steind. Para.
354. P. pentherinus (Kner). Rio Guaporé.
355. P. cordovæ Günther. Cordova.
356. P. lima Reinhardt. Rio San Francisco; Rio Grande do Sul.
357. P. macrops Eigenm. & Eigenm. Rio das Velhas.
358. P. francisci Lütken. Rio San Francisco; Rio das Velhas.
359. P. alatus (Castelnau). Araguay; Rio das Velhas.
360. P. auroguttatus (Kner). Coast streams of southeastern Brazil.
361. P. lütkenii Steind. Southeastern Brazil.
362. P. vermicularis Eigenm. & Eigenm. Eastern Brazil.
363. P. brevicauda Günther. Bahia.
364. P. robinii Cuv. & Val. La Plata to Trinidad.
Pl. unæ Steind.
365. P. wuchereri Günther. Bahia to Rio Mucuri.
366. P. johnii Steind. Rio Preto; Rio Paty.

91. RHINELEPIS Spix.

367. R. parahybæ Steind. Rio Parahyba.
368. R. agassizii Steind. Manacapuru; Rio Huallaga.
369. R. aspera Spix. Rio San Francisco; ? Parana; ? Guiana.
R. strigosa Cuv. & Val.

92. HEMIANCISTRUS Bleeker.

Pseudacanthicus Bleeker; *Chætostomus* Günther.
370. H. serratus (Cuv. & Val.). Surinam.
371. H. histrix (Cuv. & Val.). Brazil.
372. H. spinosus (Castelnau). Amazon; ? Porto Alegre.
373. H. medians (Kner). Surinam.
374. H. pictus (Kner). Barra do Rio Negro.
375. H. brachyurus (Kner). Barra do Rio Negro.
376. H. itacua (Valenciennes). La Plata.
377. H. scaphirhynchus (Kner). Solimoens.
378. H. fordii Günther. Surinam.
379. H. heteracanthus (Günther). Marañon.
380. H. aspidolepis (Günther). Veragua.
381. H. mystacinus (Kner). Caracas.
382. H. oligospilus (Günther). River Capin.
383. H. megacephalus (Günther). Surinam.
384. H. guacharote (Cuv. & Val.). Porto Rico, Trinidad.
385. H. trinitatis (Günther). Trinidad.
386. H. vittatus (Steind.). Amazon.

93. PARANCISTRUS Bleeker.

387. P. punctatissimus Steind. Araguay; Amazon.
H. niveatus Castelnau.

388. P. aurantiacus (Castelnau). Ucayale.

389. P. nigricans (Castelnau). Amazon.

94. COCHLIODON Heckel.

390. C. cochliodon Kner. Rio Cujaba.
C. hypostomus Heckel; *L. melanoptera* Natterer.

95. PANAQUE Eigenm. & Eigenm.

391. P. nigrolineatus (Peters). Orinoco; Goyaz.

392. P. cochliodon (Steind.). Cauca.

393. P. dentex (Günther). Xeberos.

96. PTERYGOPLICHTHYS Gill.

Liposarcus Günther.

394. Pt. undecimalis (Steind.). Magdalena; Cauca.

395. Pt. etentaculatum (Spix). Rio San Francisco.
H. duodecimalis Cuv. & Val.; *H. breritentaculatus* Ranzani; *A. longimanus* Kner.

396. Pt. gibbiceps (Kner). Amazon; Solimoens.

397. Pt. punctatus (Natterer). S. Vicente; Solimoens.

398. Pt. pardalis (Castelnau). Huallaga; Amazons and northward.
L. varius Cope.

399. Pt. jeanesianus (Cope). Nauta.

400. Pt. multiradiatus (Hancock). Demarara.

401. Pt. lituratus (Kner). Guapore; Xingu; eastern Brazil.

97. PSEUDANCISTRUS Bleeker.

402. Ps. barbatus (Cuv. & Val.). La Mana; Surinam.

403. Ps. guttatus (Cuv. & Val.). Guiana.

404. Ps. depressus (Günther). Surinam.

405. Ps. setosus (Boulenger). Colombia.

406. Ps. wertheimeri (Steind.). Rio Mucuri.

98. DELTURUS Eigenm. & Eigenm.

407. D. angulicauda (Steind.). Rio Mucuri; ? Rio Parahyba.

408. D. parahybæ Eigenm. & Eigenm. Parahyba.

99. HEMIPSILICHTHYS Eigenm. & Eigenm.

409. H. gobio (Lütken). Rio Parahyba.

100. ACANTHICUS Spix.

410. ? A. vicinus (Castelnau). Ucayale.

411. A. hystrix (Spix). Amazons.

412. A. genibarbis (Cuv. & Val.). ?——

101. CHÆTOSTOMUS Kner.

413. C. jelskii Steind. Amable Maria; Monterico.
414. C. latifrons Günther. Marañon.
415. C. macrops Lütken. Surinam.
416. C. stannii Kröyer. Puerto Cabello; Mamoni.
417. C. tackzanowskii Steind. Rio de Tortara; Rio de Huambo.
418. C. tectirostris Cope. Ambyiacu.
419. C. variolus Cope. Ambyiacu.
420. C. medirostris Lütken. Venezuela.
421. C. guairensis Steind. Guaire; Caracas.
422. C. sericeus Cope. Ambyiacu.
423. C. malacops Cope. Ambyiacu.
424. C. branickii Steind. Callacate, Peru; Rio de Huambo.
425. C. fischeri Steind. Mamoni.
426. C. loborhynchus Tschudi. Tullumayo.
427. C. dermorhynchus Boulenger. Canelos.
428. C. microps Günther. Canelos; Rio de Huambo; western Ecuador.
429. C. nudiceps (M. & T.). British Guiana.
430. C. erinaceus (Cuv. & Val.). Chili.
431. C. bufonius (Cuv. & Val.). Apurimac.
432. C. gymnorhynchus (Kner). Puerto Cabello.
H. korsteni Kröyer.

102. ANCISTRUS Kner.

433. A. chagresi Eigenm. & Eigenm. Rio Chagres.
434. A. stigmaticus Eigenm. & Eigenm. Goyaz.
435. A. cirrhosus (Valenciennes). La Plata to Guiana.
435a. A. cirrhosus dubius Eigenm. & Eigenm. Gurupa; Tabatinga.
436. A. leucostictus (Günther). Coary; Tabatinga; Jutahy; Huallaga; Ambyiacu.
437. A. hoplogenys (Günther). River Capin; Tajapuru.
438. A. temminkii (Cuv. & Val.). Surinam; Amazons.
A. dolichopterus Kner.
439. A. calamita (Cuv. & Val.). Apurimac.

XIII. CALLICHTHYIDÆ.

103. SCLEROMYSTAX Günther.

440. S. barbatus Quoy & Gaimard. Rio Janeiro.

104. CALLICHTHYS Linnæus.

Cataphractus Bloch, preoccupied in Mam.

441. C. callichthys Linnæus. La Plata to Trinidad.
C. tamoata L.; *C. asper* Quoy & Gaimard; *C. depressa* Swainson; *C. calatus* Cuv. & Val.; *C. laeviceps* Cuv. & Val.; *C. loricatus* Gronow; *C. kneri* Gill; *C. affinis* Günther; *C. hemiphractus* Hensel.
442. C. arcifer Hensel. Rio de Janeiro.

105. HOPLOSTERNUM Gill.

443. H. littorale (Hancock). La Plata to Trinidad.
C. subulatus Cuv. & Val.; *C. lævigatus* Valenciennes; *C. albidus* Cuv. & Val.; *H. stevardii* Gill.

444. H. thoracatum (Cuv. & Val.). Amazons and northward.
C. longifilis Cuv. & Val.; *C. personatus* Ranzani; *C. exaratus* and *pictus* M. & T.; *C. sulcatus* Kner; *C. chiquitos* Castelnau.

445. H. melampterum (Cope). Ambyiacu.

106. DECAPOGON Eigenm. & Eigenm.

446. Dec. adspersum Steind. Porto do Moz; Cudajas; Tabatinga.

107. DIANEMA Cope.

447. Di. longibarbis Cope. Ambyiacu.

108. BROCHIS Cope.

§ *? nov.*

448. B. taiosh (Castelnau). ——?

§ *Chænothorax* Cope.

449. B. bicarinatus (Cope). Marañon.

450. B. semiscutatus (Cope). Ambyiacu.

§ *Brochis* Cope.

451. B. dipterus Cope. Ambyiacu.

452. B. cœruleus Cope. Ambyiacu.

109. CORYDORAS Lacépède.

Hoplisoma Swainson; *Hoplosoma* Gill; *Gastcrodermus* Cope.

453. C. eques Steind. Solimoens.

454. C. splendens (Castelnau). Tocantins.

455. C. elegans Steind. Cudajas; Teffé.

456. C. nattereri Steind. Rio Janeiro to Rio Doce.

457. C. æneus (Gill). Trinidad.

458. C. armatus (Günther). Marañon and tributaries.

459. C. paleatus (Jenyns). La Plata and tributaries.
Corydoras marmoratus Steind.; *Callichthys punctatus* Val. and Cuv. & Val.

460. C. punctatus (Bloch). Guiana; Solimoens; Marañon.
Corydoras geoffroy Lacépède; *Corydoras ambiacus* Cope.

461. C. trilineatus Cope. Ambyiacu.
Corydoras agassizii Steind.

462. C. acutus Cope. Ambyiacu.

463. C. amphibelus Cope. Ambyiacu.

464. C. hastatus Eigenm. & Eigenm. Villa Bella.

EVENTOGNATHI.

XIV. CHARACINIDÆ.

ERYTHRININÆ.*

110. MACRODON Müller.

465. **M. microlepis** Günther. Rio Chagres; Guayaquil. Eigenm. & Eigenm., 102.

466. **M. malabaricus** (Bloch). Eastern slopes of South America from La Plata to Ria Magdalena and Huallaga. Eigenm. & Eigenm., 102.

Synodus tareira Bl. & Schn.; *Erythrinus trahira* Spix; *E. macrodon* Agassiz; *E. microcephalus* Agassiz; *E. brasiliensis* Spix; *Macrodon guarina* Val.; *M. auritus, teres, patana,* and *aimara* Cuv. & Val.; *M. ferox* Gill; *M. intermedius* Günther.

111. ERYTHRINUS Gronow.

Hetererothrinus Günther.

467. **E. unitæniatus** Spix. Rio Parahyba to Guiana and Peru; Trinidad. Eigenm. & Eigenm., 105.

E. rittatus Cuv. & Val.; *E. cinereus* Gill; *E. kessleri* Steind.

468. **E. salvus** Agassiz. San Francisco; Guiana; Orinoco. Eigenm. & Eigenm., 105.

E. gronorii Cuv. & Val.

469. **E. erythrinus** (Bloch & Schneider). Rio Janeiro to Surinam and Peru. Eigenm. & Eigenm., 105.

E. salmoneus Gronow; *E. brevicauda* Günther.

470. **E. longipinnis** Günther. Essequibo. Eigenm. & Eigenm., 105.

112. PYRRHULINA Cuv. & Val.

Holotaxis Cope.

471. **P. melanostoma** (Cope). Marañon. Eigenm. & Eigenm., 108.

472. **P. læta** (Cope). Ambyiacu. Eigenm. & Eigenm., 108.

473. **P. filamentosa** Cuv. & Val. Guianas. Eigenm. & Eigenm., 109.

474. **P. semifasciata** Steind. Amazons from Gurupa to Tabatinga. Eigenm. & Eigenm., 109.

475. **P. brevis** Steind. Amazons from Obidos to Tabatinga. Eigenm. & Eigenm., 109.

476. **P. maxima** Eigenm. & Eigenm. Tabatinga. Eigenm. & Eigenm., 109.

477. **P. nattereri** Steind. Amazons from Obidos to Cudajas. Eigenm. & Eigenm., 109.

478. **P. guttata** Steind. Amazons from Gurupa to Tabatinga; Rio Negro. Eigenm. & Eigenm., 109.

479. **P. argyrops** Cope. Marañon. Eigenm. & Eigenm., 109.

113. LEBIASINA Cuv. & Val.

480. **L. bimaculata** Cuv. & Val. Western slopes of Peru and Ecuador; Callao Bay.

* See Eigenm. & Eigenm., '89a. This paper only is referred to for description of species.

114. STEVARDIA Gill.

§ Stevardia.

481. S. albipinnis Gill. Trinidad. Eigenm. & Eigenm., 114.

§ Corynopoma Gill.

482. S. riisei Gill. Trinidad. Eigenm. & Eigenm., 114.

483. S. veedonii Gill. Trinidad. Eigenm. & Eigenm., 114.

§ Nematopoma Gill.

484. S. searlesii Gill. Trinidad. Eigenm. & Eigenm., 114.

CURIMATINÆ.*

115. ELOPOMORPHUS Gill.

485. A. melanopogon Cope. Marañon. Eigenm. & Eigenm., 3.

486. A. steatops Cope. Marañon. Eigenm. & Eigenm., 3.

487. A. elongatus Spix. Amazons. Eigenm. & Eigenm., 3.
Elopomorphus jordani Gill.

116. POTAMORHINA Cope.

488. P. pristigaster Steind. Amazons from the Rio Negro to Peru. Eigenm. & Eigenm., 3

117. PSECTROGASTER Eigenm. & Eigenm.

489. Ps. rhomboides Eigenm. & Eigenm. Rio Puty. Eigenm. & Eigenm., 4.

490. ? Ps. amazonica Eigenm. & Eigenm. Amazons. Eigenm. & Eigenm., 5.

491. Ps. ciliata Müller & Troschel. Amazo... Guiana. Eigenm. & Eigenm., 5.

118. CURIMATOPSIS Steindachner.

492. C. macrolepis Steind. Amazons. Eigenm. & Eigenm., 6.

493. C. microlepis Eigenm. & Eigenm. Jatuarana.* Eigenm. & Eigenm., 6.

119. CURIMATUS Cuvier.

Semitapeis Eigenm. & Eigenm.

§ Curimatella Eigenm. & Eigenm.

494. C. lepidurus Eigenm. & Eigenm. Rio San Francisco. Eigenm. & Eigenm.,9.

495. C. meyeri Steind. Amazons. Eigenm. & Eigenm., 7 and 10.

496. C. serpæ Eigenm. & Eigenm. *Serpa* Eigenm. & Eigenm., 7 and 10.

497. C. alburnus Müller & Troschel. Northern Brazil and northward. Eigenm. & Eigenm., 7 and 10.

497*a*. C. alburnus lineatus Eigenm. & Eigenm. Jutahy. Eigenm. & Eigenm., 7 and 10.

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* The edentulous genera of Curimatinæ have lately been revised by us (Eigenm. & Eigenm., '89 b) and only our revision is referred to here. Annals New York Academy of Science, IV, Nov., 1889. It includes the genera *Elopomorphus*, *Potamorhina*, *Psectrogaster*, *Curimatopsis*, and *Curimatus*.

§ Curimatus.

498. C. spilurus Günther. Amazons and northward. Eigenm. & Eigenm., 7 and 10.

499. C. spiluropsis Eigenm. & Eigenm. Iça. Eigenm. & Eigenm., 7 and 10.

500. C. dorsalis Eigenm. & Eigenm. Amazon and Soli noens. Eigenm. & Eigenm., 7 and 12.

501. C. nasus Steind. Canelos, Ecuador. Eigenm. & Eigenm., 7 and 13.

502. C. troschelii Günther. Western slopes of Ecuador. Eigenm. & Eigenm., 7 and 13.

503. C. elegans Steind. Southeastern Brazil. Eigenm. & Eigenm., 7 and 13.

503*a*. C. elegans bahiensis Eigenm. & Eigenm. Bahia. Eigenm. & Eigenm., 8 and 13.

504. C. argenteus Gill. Trinidad. Eigenm. & Eigenm., 8 and 13.

505. C. bimaculatus Steind. Amazon; Solimoens. Eigenm. & Eigenm., 8 and 14.

505*a*. C. bimaculatus sialis Eigenm. & Eigenm. Manacapuru. Eigenm. & Eigenm., 8 and 14.

505*b*. C. bimaculatus trachystethus Cope. Amazons. Eigenm. & Eigenm., 8 and 14.

506. C. dobula Günther. Eastern slopes of Peru and Ecuador. Eigenm. & Eigenm., 8 and 15.

507. C. güntheri Eigenm. & Eigenm. Tabatinga. Eigenm. & Eigenm., 8 and 15.

508. C. microcephalus Eigenm. & Eigenm. Surinam. Eigenm. & Eigenm., 8 and 15.

509. C. magdalenæ Steind. Magdalena system; Panama. Eigenm. & Eigenm., 8 and 16.

510. C. gilberti Quoy & Gaimard. Southeastern Brazil. Eigenm. & Eigenm., 8 and 16.

C. voga Hensel; *C. albula* Lütken.

510*a*. C. gilberti brevipinnis Eigenm. & Eigenm. La Plata. Eigenm. & Eigenm., 8 and 16.

511. C. plumbeus Eigenm. & Eigenm. Lake Hyannary. Eigenm. & Eigenm., 8 and 17.

512. C. nagelii Steind. Rio Janeiro. Eigenm. & Eigenm., 8 and 17.

513. C. leucostictus Eigenm. & Eigenm. Rio Negro; Lago Alexo. Eigenm. & Eigenm., 8 and 17.

514. C. alberti Günther, '80a, 12. Eigenm. & Eigenm., 2.

515. C. platanus Günther. La Plata. Eigenm. & Eigenm., 8 and 18.

516. C. asper Günther. Xeberos; Huallaga. Eigenm. & Eigenm., 8 and 18.

517. C. rutiloides Kner. Amazons and tributaries. Eigenm. & Eigenm., 8 and 18.

518. C. hypostomus Boulenger. Ucayale. Eigenm. & Eigenm., 8 and 18.

519. C. mivartii Steind. Magdalena. Eigenm. & Eigenm., 8 and 18.

520. C. leuciscus Günther. Amazons. Eigenm. & Eigenm., 8 and 18.

521. C. vittatus Kner. Amazon and Solimoens. Eigenm. & Eigenm., 8 and 19.

522. C. ocellatus Eigenm. & Eigenm. Xingu. Eigenm. & Eigenm., 9 and 19.

523. C. isognathus Eigenm. & Eigenm. San Paolo; Amazon and Solimoens. Eigenm. & Eigenm., 9 and 20.

524. C. knerii Steind. Amazon; Solimoens and Surinam. Eigenm. & Eigenm., 9 and 20.

525. **C. cyprinoides** (Linnæus). Amazons; Guianas. Eigenm. & Eigenm., 9 and 21.

526. **C. macrops** Eigenm. & Eigenm. Rio Puty. Eigenm. & Eigenm., 9 and 21.

527. **C. falcatus** Eigenm. & Eigenm. Gurupa; Xingu. Eigenm. & Eigenm., 9 and 22.

528. **C. simulatus** Eigenm. & Eigenm. Fontoboa; Tocantins. Eigenm. & Eigenm., 9 and 22.

529. **C. schomburgkii** Günther. Guianas. Eigenm. & Eigenm., 9 and 22.

530. **C. essequibensis** Günther. Essequibo. Eigenm. & Eigenm., 9 and 23.

§ *Anodus* Spix.

531. **C. planirostris** Gronow. Amazon; Rio Negro. Eigenm. & Eigenm., 9 and 23
C. abramoides Kner.

532. **C. laticeps** Cuv. & Val. Amazons. Eigenm. & Eigenm., 9 and 24.
C. altamazonicus Cope.

533. **C. latior** (Spix). Amazons; Surinam. Eigenm. & Eigenm., 9 and 24.

120. PROCHILODUS Agassiz.

Pacu Spix.

534. **P. humeralis** Günther. Western Andes of Ecuador. G., v, 294.

535. **P. vimboides** Heckel. Southeastern Brazil. G., v, 294.

536. **P. cephalotes** Cope. Peruvian Amazon. Cope, '78, 686.

537. **P. argenteus** Agassiz. Rio Cipo; Rio San Francisco; Rio das Velhas. G, v, 294.
P. costatus Cuv. & Val.

538. **P. affinis** Lütken. Rio das Velhas and tributaries. Lütk., '75, 189.

539. **P. nigricans** Agassiz. Amazons (? Rio Plata system, Weyenbergh), not of Günther. Steind., '81, 32.

540. **P. rubrotæniatus** Schomburgk. Cauca; Essequibo; Negro and its tributary Branco; Upper Amazon. G., v, 295, as *nigricans*.

541. **P. oligolepis** Günther. Brazil. G., v, 295.
P. nigricans. Kner, not of Agassiz.

542. **P. asper** Lütken. Caracas; Cauca. L., '74, 226.

543. **P. magdalenæ** Steind. Rio Magdalena. Steind., '78, 35.

544. **P. lineatus** Valenciennes. Lower La Plata system. G., v, 295.

545. **P. dobulinus** Cuv. & Val. Amazons. G., v, 296.

546. **P. brama** Cuv. & Val. Lower Tocantins; Calabozo. G., v, 296.

547. **P. insignis** Schomburgk. Amazons and tributaries; Guiana. G., v, 296.

548. **P. binotatus** Schomburgk. Rio Branco; Rio Negro. G., v, 296.

549. **P. tæniurus** Valenciennes. Amazons. G., v, 297.

550. **P. brevis** Steind. Rivers near Bahia. Steind., '74, 38, Pl. vi.

551. **P. ortonianus** Cope. Peruvian Amazon. Cope, '78, 685.

552. **P. hartii** Steind. Rios Jequitinhonha, Parahyba, and Pardo. Steind., '74, 35, Pl. v.

553. **P. laticeps** Steind. Orinoco, near Ciudad, Bolivar. Steind., '79, 4.

554. **P. longirostris** Steind. Cauca. Steind., '79b, 70.

555. **P. scrofa** Steind. Rio Janeiro. Steind., '81, 29.

121. CHILODUS* Müller & Troschel.

Microdus Kner; *Cænotropus* Günther.

556. C. labyrinthicus (Kner). Amazon and tributaries; Orinoco. G., v. 297.

557. C. punctatus Müller & Troschel. Savanna swamps of British Guiana. G., v. 297.

122. HEMIODUS Müller & Troschel.

558. H. notatus (Schomburgk). Guianas; Rios Trombetas, Araguay, Negro, and Guapore. G., v, 298.

559. H. kappleri Günther. Surinam. '68a, 244.

560. H. microcephalus Günther. Rio Capin. G., v, 298.

561. H. amazonum Humboldt. Amazons. G., v, 298.
P. humboldtii Cuv. & Val.

562. H. unimaculatus (Bloch). All rivers of British Guiana; Cujaba. G., v, 299.
H. crenidens Müller.

563. H. gracilis Günther. Rio Cupai; Rio San Francisco. G., v, 299.

564. H. semitæniatus Kner. Rio Guapore. G., v, 299.

565. H. immaculatus Kner. Barra do Rio Negro; Orinoco. G., v, 300.

566. H. longiceps Kner. Rio Içanno; Rio Capin. G., v, 300.

567. H. microlepis Kner. Rio Guapore; Barra do Rio Negro; Peruvian Amazon.

123. SACCODON Kner.

568. S. wagneri Kner & Steind. Ecuador. G., v, 301.

569. S. craniocephalum Thominot. Rio Guayaquil. T. '82, 248.

124. PARODON Cuvier & Valenciennes.

570. P. suborbitalis Cuv. & Val. Maracaibo; Amazon; Rio das Velhas. G., v, 301.
P. nasus Kner. *P. hilarii* Reinhardt.

571. P. buckleyi Boulenger.† Canelos. B. '87, 279.

572. P. affinis Steind. La Plata. Steind., '79a, 20, Pl. III, Fig. 3.

ANOSTOMATINÆ.

125. NANNOSTOMUS Günther.‡

573. N. beckfordi Gthr. Demarara. G., '72, 146.

574. N. trifasciatus Steind. Barra do Rio Negro; Tabatinga, '76, 75, Fig. 2.

575. N. eques Steind. Peruvian Amazon '76, 78, Fig. 3.

576. N. unifasciatus Steind. Barra do Rio Negro '76, 79, Fig. 1.

577. N. anamolus Steind. Obidos; Barra do Rio Negro, '76, 81.

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* Dr. Günther states that *Chilodus* is preoccupied, without stating where. We have not found any earlier use of the name in this form, and reinstate it here.

† Dr. Boulenger gives a key to the species of the genus Parodon.

‡ For an account of this genus see Steindachner, Ichthyologische Beiträge, v, pp. 74-82, Pl. IX, 1876.

126. ANOSTOMUS Gronow.*

§ *Anostomus* Gronow.

578. A. anostomus (Linnæus). Essequibo; Jutahy. G., v, 303.
A. salmonens Gronow.

579. A. trimaculatus (Kner). Matogrosso; Marañon; Gurupa. G., v, 304.

§ *Schizodon* Agassiz.

580. A. vittatus (Cuv. & Val.). La Plata; Araguay; Goyaz; Porto do Moz. G., v, 303.

581. A. gracilis (Kner). Rio Guapore. G., v, 304.

582. A. fasciatus (Agassiz). Amazons; British Guiana; Caracas. G., v, 304.
P. schizodon Cuv. & Val.

583. A. dissimilis Garman. Rio Puty. '90, 22.

584. A. isognathus (Kner). Cujaba; Rio San Francisco; Rio Grande do Sul. G., v, 305.
A. knerii Steind.

585. A. platæ Garman. Rosario, La Plata. '90, 23.

586. A. nasutus (Kner). Irisanga; Rio Puty. G., v, 305.

587. A. sagittarius (Cope). Marañon. Cope, '78, 689.

127. LÆMOLYTA Cope.

Schizodontopsis Garman.

588. L. tæniata (Kner). Amazons. G., v, 304.

589. L. proximus (Garman). Villa Bella; Ueranduba. '90, 19.

590. L. varius (Garman). Amazons. '90, 20.

590*a*. L. varius nitens (Garman). Içá. '90, 20.

591. L. orinocensis Steind. Orinoco. '79, 6, Pl. II, Fig. 7–7*a*.

128. CHARACIDIUM Reinhardt.

592. C. fasciatum Reinhardt. Rio Parahyba; Rio Piabanha; Rio das Velhas; Sarayacu; Orinoco. Lütken, '75, 194, Figs. 1 and 2.

593. C. steindachneri Cope. Peruvian Amazon. Cope, '78, 688.

594. C. etheostoma Cope. Ambyiacu. Cope, '72, 259, Pl. VIII, Fig. 1, and Pl. XIII, Fig. 3.

595. C. purpuratum Steind. Canelos, Ecuador. Steind., '82a, 18.

129. RHYTIODUS Kner.

596. R. microlepis Kner. Barra do Rio Negro. G., v, 305.

597. R. argenteofuscus Kner. Rio Negro. G., v, 306.

130. LEPORELLUS Lütken.

598. Lep. vittatus (Cuv. & Val.). Rio das Velhas; Irisanga; Marañon; Araguay; Goyaz; Cauca. Lütken, '75, 201, XI.
L. maculifrons Reinhardt; *Leporinus pictus* Kner.

599. Lep. nattereri Steind. Teffé; Lago Alexo; Barra do Rio Negro. Steind., '76, 66.

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* For an excellent account of this genus see Garman, '90a.

131. LEPORINUS Spix.

600. **L. maculatus** Müller & Troschel. Guiana; Goyaz. G., v, 306.

601. **L. frederici** (Bloch). Eastern rivers from the Orinoco to the La Plata, ascending Amazons to Peru. G., v, 306.
L. acutidens Val.

602. **L. obtusidens** Val. La Plata; Rio Grande do Sul; Rio San Francisco; Magdalena. G., v, 306.
L. elongatus Cuv. & Val.

603. **L. megalepis** Günther. Essequibo to Rio Janeiro; Xeberos and Ambyiacu. G., '63, 443.
L. marcgravii Reinhardt.

604. **L. reinhardtii** Lütken. Rio das Velhas. Lütken, '75, 197, Pl. IV, Fig. 10.
L. affinis Reinhardt.

605. **L. leschenaultii** Cuv. & Val. Rio Capin; Calabozo; Andes of western Ecuador. G., v, 307.

606. **L. bimaculatus** Castelnau. Rio Vermelho de Goyaz. G., v, 308.

607. **L. fasciatus** (Bloch). Rio Cupai; Guiana; Orinoco; Calabozo. G., v, 308.
L. novemfasciatus Spix.

608. **L. trifasciatus** Steind. Teffé; Huallaga. Steind., '76, 64.

609. **L. affinis** Günther. Orinoco; Capin; Jequitinhonha.

610. **L. pachyurus** Cuv. & Val. Rio Cipo; Rio Araguay. G., v, 308.

611. **L. margaritaceus** Günther. British Guiana. G., v, 309.

612. **L. mülleri** Steind. Marañon; Solimoens; Orinoco. Steind., '76, 57, Pl. IX, Fig. 5.

613. **L. nigrotæniatus** (Schomburgk). Guiana; Rio Negro, and the Amazon near Rio Negro. G., v, 309.

614. **L. melanopleura** Günther. Bahia; Rio Cipo.

615. **L. striatus** Kner. Rio Magdalena; Canelos, Ecuador; Irisanga and Caiçara in Mattogrosso; Paraguay. G., v, 310.

616. **L. agassizii** Steind. Solimoens; Içá. Steind., '76, 59, Pl. IX, Fig. 4.

617. **L. hypselonotus** Günther. Orinoco; Marañon; Xeberos. G., '68a, 244, Pl. XXII.

618. **L. eques** Steind. Rio Magdalena. Steind., '78, 40, Pl. X, Figs. 2-2a.

619. **L. tæniatus** Reinhardt. Rio das Velhas. Lütken, '75, 199, Pl. IV, Fig. 11.

620. **L. macrolepidotus** Peters. Rio Janeiro. '68, 455.

621. **L. multifasciatus** Cope. Marañon. '78, 690.

622. **L. holostictus** Cope. Marañon. *loc. cit.*

623. **L. mormyrus** Steind. Upper Parahyba and its tributary Piabanha. '75b, 30, Pl. VI.

624. **L. bahiensis** Steind. Bahia. '75b, 21, Pl. II, Fig. 2.

625. **L. copelandi** Steind. Southeastern Brazil. '75b, 26, Pl. V.

626. **L. conirostris** Steind. Southeastern Brazil. '75b, 23, Pl. IV.

TETRAGONOPTERINÆ.

132. PLETHODECTES Cope.

627. **P. erythrinus** Cope. Pebas, Ecuador. '70, 563, Fig.

133. PIABUCINA Cuv. & Val.

628. Pi. erythrinoides Val. Maracaibo. G., v, 311.

629. Pi. unitæniata Günther. Canelos, Ecuador; Guiana. G., v, 311.

630. Pi. panamensis Gill. Rio Frijoli. '76, 336.

631. Pi. elongata Boulenger. Canelos; Sarayacu. '87, 280, Pl. XXIII, Fig. 2.

134. IGUANODECTES Cope.

632. I. tenuis Cope. Ambyiacu. '72, 260, Pl. VIII, Fig. 1.

135. TETRAGONOPTERUS Cuvier.

Astyanax Baird & Girard; *Poecilurichthys* Gill; *Hemigrammus* Gill.

633. T. spilurus Cuv. & Val. Surinam. G., v, 318.

634. T. argenteus Cuv. Orinoco; Amucu; Cujaba; Amazon; Iquitos. G., v, 318.

635. T. gibbosus Steind. Rio Parahyba. Steind. '76a, 4, Pl. I, Fig. 1.

636. T. rufipes Val. Buenos Ayres. G., v, 318.

637. T. artedii Cuv. & Val. ? Hab. G., v, 319.

638. T. doceanus Steind. Rio Doce. Steind. '76a, 14.

639. T. polylepis Günther. British Guiana. G., v, 320.

640. T. chalceus Agassiz. Surinam; Essequibo; Amazons from Porto do Moz to the Ambyiacu. G., v, 320.
T. schomburgkii Cuv. & Val.

641. T. orbicularis Cuv. & Val. La Plata; Rio Parahyba; Amazon; Marañon; Essequibo; Surinam; Villa Maria. G., v, 319, 320.
T. compressus Günther.

642. T. brevirostris Günther. Western Andes of Ecuador. G., v, 321.

643. T. abramis Jenyns. La Plata and Rio Parana; Essequibo; Orinoco. G., v, 321.

644. T. lacustris Reinhardt. Rio das Velhas; Lütken, '75, 208, Pl. v, Fig. 15.

645. T. maculatus (Linnæus). Magdalena; Orinoco; British Guiana; Rio Capim; Pernambuco; Bahia; Rios Parahyba, Doce, and Mucuri; Rio Grande do Sul. G., v, 321.
S. bimaculata L; *T. linnæi* Cuv. & Val.; *T. gronovii* Cuv. & Val; *T. vittatus* Castelnau; *T. microstoma* Hensel.

646. T. bahiensis Steind. Bahia. Steind. '76a, 13.

647. T. fasciatus Cuv. La Plata; Rio Grande do Sul; Rio Janeiro; Rio Parahyba; Rio Jequitinhonha. Steind., '76a, 20, Pl. I, Fig. 3 (not G., v, 322).
T. rivularis Lütken; *T. obscurus* Hensel.

648. T. rutilus Jenyns. Cauca; Canelos, Ecuador; Rio San Francisco to Rio Plata (Xamapa, Mexico). G., v, 322, as *fasciatus*.
T. fasciatus Val., Gthr. *not* Cuvier; *T. scabripinnis* Kner *not* Jenyns; *T. microstoma* Günther; ? *T. fuscoauratus* Castelnau; *T. aneus* Hensel; *T. cuvieri* Lütken; *T. taniatus* Jenyns.

648*a*. T. rutilus jequitinhonhæ Steind. Rio Jequitinhonha. Steind., '76a, 27, Pl. II, Fig. 3.

649. T. microphthalmus Günther. Rio Rimac; Lake Amatitlan; Pacific coast of Guatemala. G., v. 324.

650. T. panamensis Günther. Panama; Yzabal. G., v, 324.
T. fischeri Steind.

651. T. dichrourus Kner. Rio Guapore; Caiçara; Paragnay. G., v, 324.
652. T. scabripinnis Jenyns. Rio Janeiro; Irisanga; (Xamapa, Mexico). G., v, 326.
653. T. jenynsii Steind. Rio Parahyba. '76a, 22, Pl. III, Figs. 1 and 2.
654. T. petenensis Günther. Rio Negro, Argentine Republic; Lake Peten; western Ecuador. G., v, 326.
655. T. æneus Günther. Rio Cadeo; Porto Alegre; Bahia Soldado; Rio Chagres; (Rio Frijoli; Oaxaca). G., v. 326.
656. T. wappi Cuv. & Val. British Guiana. G., v, 326.
657. T. peruvianus Müller & Troschel. Pascamayo, Peru. G., v, 327.
658. T. oligolepis Günther. British Guiana. G., v, 327.
659. T. chrysargyreus Günther. Essequibo. G., v, 328.
660. T. grandisquamis Müller & Troschel. British Guiana. G., v, 328.
661. T. lepidurus Kner. Amazons from Obidos to Tabatinga; Guapore.
662. T. xinguensis Steind. Xingu. Steind., '82, 32.
663. T. huambonicus Steind. Callacate and Rio Huambo, Peru. '82, 25, Pl. v, Fig. 1.
664. T. polyodon Günther. Guayaquil. G., v, 330.
665. T. trinitatis Lütken. Trinidad. '74, 234.
666. T. tæniurus Gill. Trinidad. Lütken, '74, 233.
667. T. brevoortii Gill. Trinidad. Lütken, '74, 232.
668. T. sawa Castelnau. Rio Crixas. G., v, 317.
669. T. viejita Cuv. & Val. Lake Maracaibo. G., v, 317.
670. T. orbignyanus Cuv. & Val. Buenos Ayres. G., v, 317.
671. T. agassizii Steind. Tabatinga; Cudajas. '76, 41, Pl. VIII, Fig. 2.
672. T. alburnus Hensel. Rio Cadeo. Steind., '76a, 24.
673. T. bairdii Steind. Tabatinga. Steind., '82, 35.
674. T. bartlettii Günther. Marañon; Ambyiacu. G., '66b, 30.
675. T. bellottii Steind. Tabatinga. Steind., '82, 34.
678. T. branickii Steind. Rio Zurumilla (boundary between Ecuador and Peru). '82, 21, Pl. I, Fig. 3.
679. T. carolinæ Gill. Rio Napo or Marañon. '70, 92.
680. T. caucanus Steind. Cauca. '80, 20, Pl. VI, Fig. 2.
681. T. collettii Steind. Obidos; Hyavary. '82, 33, Pl. VII.
682. T. copei Steind. Santarem. '82, 35, Pl. VI, Fig. 6.
683. T. cordovæ Günther. Rio de Cordova. '80, 12.
684. T. diaphanus Cope. Marañon. '78, 691.
685. T. elegans Steind. Obidos. '82, 36, Pl. VII, Fig. 4.
686. T. gracilis Reinhardt. Lagoa Santa; Rio das Velhas. Lütken, '75, 217, Pl. V, Fig. 16.
687. T. gronovii Kner & Steind. Rio Bayano. '64, 46.
688. T. hauxwellianus Cope. Hyavary; Santarem; Pebas. '70, 560.
689. T. iheringii Boulenger. Rio Grande do Sul. '87, 172.
690. T. ipanquianus Cope. Urubamba; Marañon. '77, 44.
691. T. jelskii Steind. Monterico; Huambo; Peru. '75c, 40.
692. T. longior Cope. Marañon. '78, 691.
693. T. lütkenii Boulenger. Rio Grande do Sul. '87, 173.

694. T. maximus Steind. Tullumayo; Monterico. '75c, 43, Pl. VII.
T. alosa Günther.
695. T. multiradiatus Steind. Teffé. '76, 44.
696. T. nanus Reinhardt. Rio das Velhas. Lütken, '75, 218, Pl. V, Fig. 17.
697. T. ocellifer Steind. Villa Bella; Cudajas. '82, 32, Pl. VII, Fig. 5.
698. T. orientalis Cope. Para. '70, 559.
699. T. ortoni Gill. Marañon and Napo. '70, 92.
700. T. ovalis Günther. Xeberos. '68a, 245.
701. T. pectinatus Cope. Pebas. Cope, '70, 560.
702. T. phœnicopterus Cope. Ambyiacu. '72, 260.
703. T. schmardæ Steind. Tabatinga. '75c, IV, 37, Pl. VII, Fig. 6.
704. T. stilbe Cope. Para. '70, 559.
705. T. tabatingæ Steind. Tabatinga. '76, 43.
706. T. unilineatus Gill. Trinidad. '58, 420.
707. T. robustulus Cope. Pebas. '70, 561.

136. LÜTKENIA Steind.

708. L. insignis Steind. Santarem; Tabatinga. 75c, 38, Pl. VIII, Fig. 1.

137. SCISSOR Günther.

709. S. macrocephalus Günther. Surinam. G., V, 331.

138. HENOCHILUS Garman.

710. H. wheatlandi Garman. Rio Mucuri. Garman, '90a, 1.

139. PSEUDOCHALCEUS Kner.

711. Ps. lineatus Kner. Western slopes of Ecuador. G., V, 332.

140. ODONTOSTILBE Cope.

712. O. fugitiva Cope. Pebas; Villa Bella; Santarem. '70, 566, with Fig.
713. O. pulcher Gill. Trinidad. '58, 419. Lütken, '74, 236.

141. CHEIRODON Girard.

714. C. interruptus (Jenyns). Maldonado. G., V, 332.
715. C. pisciculus Girard. Santiago. G., V, 332.
716. C. agassizii Steind. Jaturana. '82, 38.
717. C. eques Steind. Villa Bella; Obidos. Steind., '82, 37.
718. C. insignis Steind. Cauca; Panama; Villa Bella. '80, 22, Pl. VI, Fig. 3.
719. C. nattereri Steind. Obidos. '82c, 180.
720. C. pequira (Natterer). Cujaba; Rio Guapore. Steind., '82, 38.
721. C. piaba Lütken. Rio das Velhas. '75, 219.
722. C. pulcher Steind.* Villa Bella. Steind., '82, 39.

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* Should *Odontostilbe* Cope prove to be a subgenus of *Cheirodon*, as is supposed by Lütken (Vidensk. Medd. Nat. For. Kjöb., 1874, 236), this species must be renamed as *Tetragonopterus pulcher* Gill, is placed by Lütken in the subgenus *Odontostilbe* Cope, viz.: *Chirodon* (*Odontostilbe*) *pulcher* (Gill) Lütken, *loc. cit.* We would suggest the name *steindachneri* for this species.

142. APHIOCHARAX Günther.

723. A. pusillus Günther. Marañon and tributaries. '68a, 245.

724. A. alburnus Günther. Marañon. '69, 424, Fig. 2.

725. A. filigerus Cope. Pebas, Ecuador. '70, 564.

143. CHALCEUS Cuvier.

726. C. macrolepidotus Cuvier. Guiana; Rio Cupai; Ambyiacu. G., v, 333.

727. C. erythrurus Cope. Ambyiacu. '72, 262.

144. BRYCON Müller & Troschel.

728. B. schomburgkii M. & T. Essequibo. G., v, 333.

729. B. orbignyanus (Cuv. & Val.). Rio Plata; Guapore. G., v, 333.

730. B. rodopterus (Cuv. & Val.). Buenos Ayres. G., v, 333.

731. B. devillei (Castelnau). Bahia; Rio Parahyba; Rio Jequitinhonha. Steind., '76a, 29, Pl. IV, Figs. 2–2*a*.
B. insignis Steind.

732. B. opalinus (Cuvier). Brazil. G., v, 334.
? *C. amazonicus* Agassiz.

733. B. nattereri Günther. Irisanga. G., v, 334.

734. B. bahiensis Günther. Bahia. G., v, 334.

735. B. falcatus Müller & Troschel. Guiana. G., v, 334.

736. B. orthotænia Günther. Rio Cipo; La Plata. G., v, 335.

738. B. brevicauda Günther. Rio Jocintins; Rio Capin. G., v, 335.

739. B. atricaudatus (Kner). Western Andes of Ecuador. G., v, 336.

740. B. carpophagus (Cuv. & Val.). Guiana; Brazil. G., v, 336.

741. B. hilarii (Cuv. & Val.). Brazil. G., v, 336.

742. B. pesu (Müller & Troschel). Lower Essequibo; Mazaruni, Guiana. G., v, 336.

743. B. capito Cope. Ambyiacu. '72, 261.

744. B. chagrensis Kner. Chagres. Steind., '76a, 32.
B. striatulus Kner.

745. B. ferox Steind. Rio Mucuri. '76a, 25, Pl. IV, Figs. 1–1*a*.

746. B. labiatus Steind. Cauca. '80, 23, Pl. III, Fig. 1.

747. B. lineatus Steind. La Plata. '66, 4, Pl. II.

748. B. longiceps Steind. Orinoco near Ciudad Bolivar. '79, 8, Pl. I, Fig. 5.

749. B. lundii Reinhardt. Rio das Velhas. Lütken, '75, 221.

750. B. moorei Steind. Rio Magdalena system. '78, 42, Pl. V, Figs. 2–2b.

751. B. reinhardti Lütken. Rio das Velhas; Rio Doce; Rio Parahyba; Rio Jequitinhonha. Steind., '76a, 27, Pl. III, Figs. 3–3a.

752. B. rubricauda Steind. Cauca. '80, 25, Pl. VIII, Figs. 1–1a.

753. B. stübelii Steind. Iquitos; Rio Amazonas. '82, 13, Pl. I, Fig. 1.

754. B. stolzmanni Steind. Chota, Peru. '79, 22, Pl. II, Fig. 6.

§ *Chalcinopsis* Kner.

755. B. dentex Günther. (Guatemala); Ecuador. G., v, 337.

756. B. striatulus Kner. Panama. G., v, 337.

757. B. chagrensis Kner. Rio Chagres. G., v, 338.

758. B. alburnus Günther. Western Andes of Ecuador. G., v, 338.

§ *Megalobrycon* Günther.

759. B. melanopterum Cope. Ambyiacu. '72, 262.

760. B. cephalus Günther. Marañon. '69a, 423, Fig. 1.

761. B. erythropterum Cope. Ambyiacu. '72, 263.

145. BRYCONOPS Kner.

762. B. alburnoides Kner. Rio Guapore. G., v, 339.
B. alburnus Kner.

763. B. lucidus Kner. Rio Branco. G., v, 339.

146. CREATOCHANES Günther.

764. C. melanurus Bloch. Guiana; Obidos; Rio Tapajos. G., v, 329.

765. C. affinis Günther. British Guiana. G., v, 329.

766. C. caudomaculatus Günther. South America. G., v, 330.

147. CREAGRUTUS Günther.

Piabina Lütken.

767. Cr. müilleri Günther. Canelos, Ecuador. G., v, 339.

768. Cr. affinis Steind. Cauca. '80, 17.

769. Cr. peruana Steind. Rio Huambo; Monterico, Peru. '75c, iv, 46.
C. nasutus Günther.

770. Cr. argentea (Reinhardt). Rio das Velhas. Lütken, '75, 226, Fig. 1–2.

148. CHALCINUS Cuv. & Val.*

Triportheus Cope.

771. Ch. angulatus Agassiz. Orinoco; Guiana; Amazons. G., v, 340.
Ch. nematurus Kner; *Triportheus flavus* Cope; *C. trifurcatus* Castelnau; *Ch. müilleri* Fil.; *C. brachypoma* Cuv. & Val., not Günther; *? C. rotundatus* Schomburgk.

771*a*. Ch. angulatus curtus Garman. Para; Arary. '90, 4.

771*b*. Ch. angulatus vittatus Garman. Amazon. '90, 4.

771*c*. Ch. angulatus signatus Garman. Rio Puty. '90, 4.

771*d*. Ch. angulatus fuscus Garman. Amazons. '90, 4.

772. Ch. albus (Cope). Amazons. '72, 264.
Ch. kneri Steind. (adult).

773. Ch. güntheri Garman. Essequibo; San Francisco. '90, 4.

774. Ch. pictus Garman. Jutahy. '90, 5.

775. Ch. auritus Cuv. & Val. Rio Aragnay. G., v, 341.

776. Ch. elongatus Günther. Orinoco; Amazons. G., v, 342.

777. Ch. culter Cope. Iça; Solimoens; Marañon. '72, 265, Pl. xiv, Fig. 3.

778. Ch. magdalenæ Steind. Magdalena; Cauca. '78, 44, Pl. xi, Figs. 1–2.

779. Ch. paranensis Günther. La Plata; Parana. '74, 454.

149. GASTEROPELECUS Gronow.

780. G. sternicla (Linnæus). Essequibo; Amazons. G., v, 342.

781. G. stellatus Kner. Iquitos; Amazons; Rio Cujaba; Paragnay. G., v, 343.
? G. securis Filippi.

* For an account of the species of this genus see Garman, '90.

782. G. strigatus Günther. Manacapuru. G., v, 343.

783. G. maculatus Steind. Mamoni River, Panama. G., v, 343, and Steind., '79, 20, Pl. I, Fig. 4.

784. G. fasciatus Garman. Amazons. '90, 9.

785. G. pectorosus Garman. Amazons. '90, 9.

150. PIABUCA Cuvier.

786. P. argentinus (Linnæus). Guiana; Brazil. G., v, 343.
Trutta dentata Koelreuter.

787. P. spilurus Günther. Rio Cupai. G., v, 344.

151. PARAGONIATES Steind.

788. Pa. alburnus Steind. Teffé; Canelos. '76, 69, Pl. VIII, Fig. 3.

789. Pa. mülleri Steind. Obidos. '76, 72.

790. Pa. microlepis Steind. Rio Janeiro; Rio Macacos. '76a, III, 33.

152. AGONIATES Müller & Troschel.

791. A. halecinus M. & T. Curuni. G., v, 344.

153. LEPTAGONIATES Boulenger.

792. L. steindachneri Boulenger. Sarayacu. '87a, 282, Pl. XXIII, Fig. 3.

HYDROCYONINÆ.

154. ANACYRTUS Günther.

793. A. gibbosus (Linnæus). Guiana; Amazons. G., v, 346.
Epicyrtus macrolepis Kner.

794. A. pauciradiatus Günther. Amazons. G., v, 346.

795. A. sanguineus Cope. Ambyiacu; Marañon. '72, 266, Pl. IX, Fig. 1.

796. A. tectifer Cope. Pebas. '70, 565.

797. A. limæsquamis Cope. Marañon. '78, 686.

798. A. knerii Boulenger. Canelos. '87a, 282.

155. RŒSTES Günther.

Lycodon Kner.

799. R. molossus (Kner). Brazil. G., v, 347.

800. R. alatus Steind. Rio Magdalena. '78, 49.

156. RŒBOIDES Günther.

801. R. affinis (Günther). Calabozo; Amazons. '68, 246.
R. rubrivertex Cope.

802. R. myersii Gill. Amazons south to Rio Puty. '70, 92.

803. R. dayi Steind. Rio Magdalena; Cauca. '78, 45.

804. R. bicornis Cope. Pebas. '70, 564.

805. R. bonariensis Steind. La Plata. '79a, 23, Pl. VIII, Fig. 1.

806. R. xenodon Reinhardt. Amazons; Rio das Velhas. Lütken, '75, 227.

807. R. microlepis Reinhardt. Brazil. G., v, 347.

808. R. guatemalensis Günther. Rio Chagres; (Huamuchal) G., v, 347.

157. CYNOPOTAMUS Kner.

809. C. argenteus (Val.). La Plata; Araguay. G., v, 348.

810. C. humeralis (Val.). La Plata; Goyaz; Sao Paolo; Rosario. G., v, 348.

811. C. knerii Steind. Cujaba; Rio Paraguay; Irisanga; Tabatinga. '78, 48.
C. humeralis Kner, not Val.

812. C. magdalenæ Steind. Magdalena and Cauca. '78, 61, Pl. XII, Figs. 2–2a.

813. C. amazonum Günther. Xeberos. '68a, 246.

814. C. gulo Cope. Pebas. '70, 565.

815. C. biserialis Garman. Amazons. '90, 14.

158. EXODON * Müller and Troschel.

Hystricodon Günther.

816. E. paradoxus M. & T. Guiana; Crixas; Araguay; Amazon. G., v, 349.
E. exodon Cuv. & Val.

159. SALMINUS Agassiz.

817. S. hilarii Cuv. & Val. Rio San Francisco; Amazon; Goyaz. G., v, 349.

818. S. cuvieri Cuv. & Val. Rio Cipo; Rio San Francisco; Rio das Velhas. G., v, 350, as *brevidens*.

819. S. brevidens (Cuvier). Parana; Rio Plata. G., v, 350, as *maxillosus*.
S. maxillosus Cuv. & Val.

820. S. orbignyanus Cuv. & Val. Jacuhy. Cuv. & Val., XXII, 65.

821. S. affinis Steind. Cauca. '80, 28, Pl. VII, Figs. 2–2a.

160. OLIGOSARCUS Günther.

822. O. argenteus Günther. Brazil. G., v, 351.

161. XIPHORHAMPHUS Müller & Troschel.

823. X. falcirostris (Cuv.). Demerara; Rio Cupai; Marañon and tributaries. G. v, 354.

824. X. falcatus (Bloch). Guiana; Amazon. G., v, 354.

825. X. microlepis (Schomburgk). British Guiana; Rio Negro; Amazons. G., v, 355.

826. X. ferox Günther. Essequibo. G., v, 355.

827. X. pericoptes Müller & Troschel. Brazil. G., v, 355.

828. X. hepsetus (Cuv.). Southeastern Brazil; Buenos Ayres. G., v, 356.
X. hepseticus Castelnau; *X. jenynsii* Günther.

829. X. oligolepis Steind. La Plata. '67, 339.

830. X. macrolepis Steind. Rio Jequitinhonha. '76a, 36.

831. X. lacustris Reinhardt. Rio das Velhas. Lütken, '75, 232.

832. X. heterolepis Cope. Marañon. '78, 687.

833. X. anomalus Steind. Cauca. '80, 32.

834. X. abbreviatus Cope. Marañon. '78, 687.

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*Dr. Günther, v, 349, states that the name *Exodon* is preoccupied. We have been unable to find the form *Exodon* used elsewhere, and it is retained here.

162. XIPHOSTOMA Spix.

835. Xa. lucius (Cuvier). ——? G., v, 357.

836. Xa. cuvieri Spix. Guiana; Tocantins. G., v, 357.
Xa. oseryi Castelnau.

837. Xa. ocellatum Schomburgk. Guiana; Rio Negro. G., v, 357.

838. Xa. maculatum Cuv. & Val. Xingu, near Porto do Moz; Rio Cupai; Marañon. G., v, 357.
Xa. tædo Cope.

839. Xa. hujeta Cuv. & Val. Maracaibo. G., v, 358.

840. Xa. longipinne Steind. Rio Negro. '76, 84.

163. LUCIOCHARAX Steind.

841. L. insculptus. Rios Magdalena, Cauca, and Mamoni. '78, 51, Pl. XIII, Figs. 2–2b.

164. HYDROLYCUS Müller & Troschel.

842. H. scomberoides (Cuvier). Orinoco; Guiana; Rio Capin; Aragnay; Iquitos. G., v, 358.

843. H. pectoralis Günther. Marañon; Xeberos. '66b, 30.

844. H. copei Gill. Napo and Marañon. '70, 93.

165. CYNODON Spix.

Raphiodon Agassiz; *Hydropardus* Reinhardt.

845. C. vupinus Spix. Calabozo; Marañon; Huallaga. G., v, 359.

846. C. gibbus Spix. Marañon; Huallaga. G., v, 359.

CRENUCHINÆ.

166. CRENUCHUS Günther.

847. Cs. spilurus Günther. Essequibo; Hyavara; Tabatinga. G., v, 365.

SERRASALMONINÆ.

167. MYLESINUS Cuv. & Val.

848. M. schomburgkii Cuv. & Val. Guiana; Brazil. G., v, 366.

168. PYGOPRISTIS Müller & Troschel.

849. P. denticulatus (Cuvier). British Guiana. G., v, 367.
Serrasalmo punctatus Schomb.; *P. fumarius* M. & T.

850. P. serrulatus Cuv. & Val. Araguay; Amazons. G., v, 367.

169. PYGOCENTRUS Müller & Troschel.

851. Py. palometa Cuv. & Val. Brazil. G., v, 366.

852. Py. piraya (Cuv.). Guiana; Amazons; Rio Puty; Rio das Velhas. G., v, 368.
Serrasalmo piranha Spix; *S. nigricans* Spix.

853. Py. scapularis Günther. Essequibo. G., v, 368.

854. Py. niger (Schomburgk). Upper courses of streams of Guiana. G., v, 369.

855. Py. nattereri (Kner). Orinoco · La Plata; Matogrosso and Cujaba. G., v, 369.

856. Py. alatus Gill. Marañon and Napo. '70, 93.

857. Py. notatus Lütken. Venezuela. '74, 238.

170. SERRASALMUS Lacépède.

858. S. gibbus Castelnau. Araguay. G., v, 366.

859. S. caribe Cuv. & Val. Orinoco. G., v, 366.

860. S. rhombeus (Linnæus). Guiana; Araguay. G., v, 369.

861. S. marginatus Val. La Plata; Brazil. G., v, 370.

862. S. spilopleura Kner. La Plata; Rio Capin; Brazil; Guiana. G., v, 370.
? S. aureus Spix.

863. S. humeralis Cuv. & Val. Brazil; Huallaga. G., v, 370.

864. S. gymnogenys Günther. River Capin; British Guiana. G., v, 371.

865. S. maculatus Kner. Rio Guapore; Huallaga. G., v, 371.

866. S. elongatus Kner. Rio Guapore; Huallaga. G., v, 371.

887. S. æsopus Cope. Ambyiacu. '72, 269.

668. S. iridopsis Cope. Ambyiacu. Cope, '72, 268, Pl. IX, Fig. 2.

869. S. immaculatus Cope. Marañon. '78, 692.

870. S. brandtii Reinhardt. Rio das Velhas. Lütken, '75, 237 and Fig.

871. S. iritans Peters. Apure. '77, 472.

171. STETHAPRION Cope.

872. St. chryseum Cope. Ambyiacu; Marañon. '72, 261.

873. St. erythrops Cope. Santarem to Pebas. '70, 562 with Fig.

874. St. copei Steind. Tabatinga. '82, 40.

172. MYLETES Cuvier.

Myleus and *Tometes* Cuv. & Val.

875. M. acanthogaster Cuv. & Val. Lake Maracaibo. G., v, 372.

876. M. lobatus Cuv. & Val. Amazon. G., v, 372.

877. M. schomburgkii Jardine. Amazon; Guiana. G., v, 372 and 376.
M. divaricatus and *palometa* Cuv. & Val.

878. M. luna Cuv. & Val. Cayenne. G., v, 372.

879. M. unilobatus (Cuv. & Val.). Cayenne. G., v, 372.

880. M. edulis Castelnau. Rio Paraguay. G., v, 372.
M. bidens Cuv. & Val.

881. M. torquatus Kner. Rio Branco. G., v, 372.

882. M. asterias Müller & Troschel. Essequibo, and Mazaruni near Cascades. G., v, 372.

883. M. rubripinnis M. & T. Essequibo. G., v, 373.

884. M. rhomboidalis Cuv. Amazon; Guiana. G., v, 373.
Tetragonopterus latus Schomb.

885. M. parma Günther. River Capin. G., v, 374.

886. M. macropomus Cuv. Brazil. G., v, 374.

887. M. brachypomus Cuv. Brazil; Guiana; La Plata. G., v, 374.
M. facu Humboldt.

888. M. orbignyanus Cuv. & Val. Parana. G., v, 373.

839. **M. duriventris** Cuv. Calabozo; Buenos Ayres; Santarem to Huallaga. G., v, 375.
Tetragonopterus aureus Spix.

890. **M. bidens** Spix. Villa Bella to Marañon. G., v, 375.

891. **M. ellipticus** Günther. Essequibo. G., v, 376.

892. **M. hypsauchen** Müller & Troschel. Santarem to Huallaga; Rio Guapore; Tapacuma Lake. G., v, 376.

893. **M. maculatus** Kner. Rios Maroni and Guapore. G., v, 377.

894. **M. altipinnis** (Cuv. & Val.). San Francisco; Cipo. G., v, 377.

895. **M. discoideus** Kner. Brazil. G., v, 377.

896. **M. trilobatus** (Cuv. & Val.). Cayenne. G., v, 378.

897. **M. setiger** (Müller & Troschel). Guiana; Amazon. G., v, 378.
M. doidyxodon Cuv. & Val.; *M. pacu* Schomburgk.

898. **M. oligocanthus** (Müller & Troschel). Demarara. G., v, 378.

899. **M. albiscopus** Cope. Ambyiacu. '72, 267.

900. **M. brachypoma** Günther. La Plata. G., '80.

901. **M. herniarius** Cope. Ambyiacu; Marañon. Cope, '72, 268, Pl. XII, Fig. 3.

902. **M. knerii** Steind. Maroni River, Guiana. '81, 27, Pl. VII, Fig. 2.

903. **M. lippincottianus** Cope. Para. '70, 561.

904. **M. macropomus** Peters. Apure. '77, 473.

905. **M.*** **micans** Reinhardt. Rio das Velhas. Lütken, '75, 241 and Fig.

906. **M. nigripinnis** Cope. Teffé; Marañon. Cope, '78, 693.

907. **M. oculus** Cope. Ambyiacu. '72, 268, Pl. XII, Fig. 2.

173. METYNNIS Cope.

908. **Me. luna** Cope. Marañon. '78, 692.

174. CATOPRION Müller & Troschel.

909. **C. mento** (Cuv.). Guiana; Brazil. G., v, 379.

GYMNONOTI.

XV. ELECTROPHORIDÆ.

175. ELECTROPHORUS Gill.

910. **E. electricus** Linn. Brazil and northward. G., VIII, 10.

XVI. STERNOPYGIDÆ.

176. STERNARCHUS Bloch & Schneider.

911. **S. albifrons** (Linn.). Brazil and Surinam (Para; Santarem; Manacapuru; Teffé; Obidos; Canelos; Apure; Urubamba; Surinam). G., VIII, 2.
Apteronotus passan Lac.; *S. laecpedii* and *maximiliani* Castelnau.

912. **S. brasiliensis** Reinhardt. Rio das Velhas. G., VIII, 3.

913. **S. nattereri** Steind. Barra do Rio Negro. G., VIII, 3.

914. **S. schotti** Steind. Barra do Rio Negro; Manacapuru; Peruvian Amazon. G., VIII, 3.

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* Tometes.

915. S. bonapartii Castelnau. Manacapuru; Peruvian Amazon. G., VIII, 3.

916. S. sachsi Peters. Apure. '77, 473.

917. S. balænops Cope. Peruvian Amazon. '78, 682.

918. S. virescens Val. La Plata. 47a, 11.

919. S. macrolepis Steind. Amazon near Rio Negro; Manacapuru. '81b, 14.

177. STERNARCHORHYNCHUS Castelnau.

920. S. oxyrhynchus (Müller & Troschel). Essequibo. G., VIII, 4.

921. S. macrostoma Günther. Upper Amazon. G., VIII, 4.

922. S. mormyrus (Steind.) Peruvian Amazon. G., VIII, 4.

923. S. curvirostris Boulenger. Canelos. '78a, 282.

924. S. mülleri Steind. Para. '81b, 15.

178. RHAMPHICHTHYS Müller & Troschel.

925. Rs. rostratus (Linnæus). Guianas; Rio Negro; Matogrosso. G., VIII, 5.
Gymnotus longirostris Lacépède; *Rs. schomburgkii* and *schneideri* Kaup.

926. Rs. reinhardtii Kaup. Para; Manacapuru; Rio Negro. G., VIII, 5.
Rs. blochii Kaup.

927. Rs. marmoratus Castelnau. Aragnay; Amazons, from Para to Ucayale; Guianas; Orinoco; Rio Plata. G., VIII, 5.
Rs. pantherinus and *lineatus* Castelnau.

179. BRACHYRHAMPHICHTHYS Günther.

928. B. elegans Steind. Amazon, near Rio Negro. '80, 37,

929. B. artedi (Kaup). Rio Mona, French Guiana. G., VIII, 6.

930. B. mülleri (Kaup). French Guiana. G., VIII, 6.

931. B. brevirostris Steind. Cauca; Rio Guapore; Santarem. G., VIII, 6.

180. STERNOPYGUS Müller & Troschel.

932. S. carapo (Linnæus). Rio das Velhas; Amazon, from Para to Canelos, and northward. G., VIII, 7.
S. macrurus Bloch & Schneider; *C. arenatus* Eyd. & Soul.; *C. sanguinolentus* Castelnau; *S. marcgravii* Reinhardt.

933. S. virescens (Val.). Rio das Velhas; Rio Parana; La Plata; Marañon and tributaries; Guianas; Orinoco. G., VIII, 7.
S. tumifrons and *lineatus* M. & T.; *S. microstomus* Reinhardt.

934. S. axillaris G. Para. G., VIII, 8.

935. S. troschelii Kaup. Marañon; British Guiana. G., VIII, 8.
S. virescens Müller & Troschel, not Val.

936. S. æquilabiatus Humboldt. Rio Magdalena system; Rivers near Guayaquil (near Corapo). Steind., '78, 54.

937. S. humboldti Steind. Rio Magdalena system; Mamoni. '78, 55.

938. S. obtusirostris Steind. Rio Madeira; Lago Alexo; Manacapuru; Teffé; Rio Puty. '81, 43

181. CARAPUS Cuv.

939. C. fasciatus (Pallas). La Plata, north to Guatemala. G., VIII, 9.
Gymnotus albus Pallas, *brachyurus* Bloch; *putaol* Lacépède; *carapo* Bloch & Schneider; *C. brachyurus* Cuvier; *inæquilabiatus* Valenciennes.

ISOSPONDYLI.

XVII. STOLEPHORIDÆ.

182. STOLEPHORUS* Lacépède.

Engraulis Cuvier.

940. S. macrolepidotus (Kner & Steind.). Rio Bayano. G., VII, 385.

941. S. olidus Günther. La Plata. '80.

942. S. nattereri (Steind.). Para. '79b, 57.

943 S. brevirostris (Günther). Province of Bahia. G., VII, 392.

944. S. poeyi (Kner & Steind.). Rio Bayano. G., VII, 392.

945. S. surinamensis (Bleeker). Surinam; River Capin; Bahia. G., VII, 393.

946. S. spinifer (Cuv. & Val.). Guianas; Bahia; Panama. G., VII, 394.

183. PTERENGRAULIS Günther.

947. P. atherinoides (Linnæus). Guianas; Rio Capin; Para to Gurupa; Rio Janeiro. G., VII, 398.

184. LYCENGRAULIS Günther.

948. L. batesii G. Rio Para. G., VII, 399.

XVIII. CLUPEIDÆ.

185. CLUPEA Linnæus.

949. C. amazonica Steind. Para. '76, 65.

186. PELLONA Cuvier.

950. P. flavipinnis Val. Amazon; La Plata. G., VII, 454.
P. orbignyana and *castelnæana* Cuv. & Val.

951. P. altamazonica Cope. Ambyiacu. '72, 256.

XIX. ELOPIDÆ.

187. MEGALOPS Lacépède.

952. M. thrissoides (Bloch & Schneider). Magdalena system (Atlantic entering rivers). G., VII, 472.

Clupea apalike Lacépède; *gigantea* Shaw; *M. atlanticus* Cuv. & Val.

XX. OSTEOGLOSSIDÆ.

188. OSTEOGLOSSUM Vandelli.

Ischnosoma Spix; *Scleropages* Günther.

953. O. bicirrhosum Agassiz. Amazons (Para to Huallaga); Guianas. G., VII, 378.
O. vandellii Cuv.; *arowana* Schomburgk; *minus* Val.

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* Many other species of this genus not enumerated here are found on the coasts of South America, and may at times be found in the rivers.

XXI. ARAPAIMIDÆ.

189. ARAPAIMA Müller.

Sudis Cuv.; *Vastres* Cuv. & Val.

954. **A. gigas** Cuv. Bahia; Peruvian Amazon; British Guiana. G., VII, 379.
S. pirarucu Spix; V. *cuvieri, mapæ, agassizii, arapaima* Cuv. & Val.

XXII. GALAXIIDÆ.

190. GALAXIAS Cuv.

Mesites Jenyns.

955. **G. attenuatus** (Jenyns). Falkland Islands; southern part of South America (? north to Peru). G., VI, 210.
G. truttaceus Val.; *G. scriba* and *maculatus* Richardson.

956. **G. coppingeri** Günther. Alert Bay. G., '81, 21.

957. **G. maculatus** (Jenyns). Tierra del Fuego; Patagonia. G., VI, 212.

958. **G. alpinus** (Jenyns). Alpine fresh-water lakes in Hardy Peninsula, Tierra del Fuego. G., VI, 212.

959. **G. gracillimus** (Canestrini). Chili. G., VI, 213.

XXIII. APLOCHITONIDÆ.

191. APLOCHITON Jenyns.

Farionella Cuv. & Val.; *Haplochiton* G.

960. **A. zebra** Jenyns. Tierra del Fuego; Falkland Islands (East Bay; fresh water at Tom Bay). G., V, 381.
Farionella gayii Cuv. & Val.

961. **A. tæniatus** Jenyns. Tierra del Fuego. G., V, 382.

HAPLOMI.

XXIV. CYPRINODONTIDÆ.

192. FUNDULUS Lacépède.

962. **F. guatemalensis** Günther. Western Ecuador (Guatemala). G., VI, 321.

193. RIVULUS Poey.

963. **R. urophthalmus** Günther. Para. G., VI, 327.

964. **R. micropus** (Steind.) Rio Negro to Pebas; Venezuela; Trinidad.
Not *R. micropus* Günther, VI, 327 = nom. sp. nov.

965. **R. ocellatus** Hensel. Rio de Janeiro. '68, 365.

966. **R. elegans** Steind. Cauca. '80, 33.

967. **R. poeyi** Steind. Cayenne; Para. '76, 117.

194. CYNOLEBIAS Steind.

968. **C. elongatus** Steind. La Plata. '81a, 11.

969. **C. bellottii** Steind. La Plata. '81a, 9.

970. C. maculatus Steind. La Plata. '81a, 10.

971. C. robustus Günther. San Antonio; Buenos Ayres. '83.

972. C. porosus Steind. Pernambuco. '76, 124.

195. ORESTIAS Cuv.

973. O. cuvieri Cuv. & Val. Lake Titicaca. G., VI, 328.
O. humboldtii Cuv. & Val.

974. O. pentlandii Cuv. & Val. Lake Titicaca. G., VI, 329.

975. O. jussiei Cuv. & Val. Lake Titicaca. G., VI, 329.

976. O. agassizii Cuv. & Val. Lakes Titicaca and Junin. G., VI, 330.
O. owenii Cuv. & Val.; *O. tschudii* Castelnau.

196. JENYNSIA Günther.

977. J. lineata (Jenyns). Maldonado. G., VI, 331.

197. ANABLEPS Bloch.

978. A. anableps (Linnæus). Guianas. G., VI, 337.
A. tetrophthalmus Bloch; *surinamensis* Lacépède; *gronovii* Cuv. & Val.; *lineatus* Gronow.

979. A. elongatus Cuv. & Val. Cayenne. Cuv. & Val., XVIII, 267, Pl. 541.

198. PŒCILIA Bloch & Schneider.

980. P. gillii (Kner & Steind.). Rio Chagres. '64, Pl. 4, Fig. 1.

981. P. surinamensis Müller & Troschel. Surinam. '44, 36.

982. P. vivipara Bloch & Schneider. Brazil; Guianas; Martinique. G., VI, 345.
P. surinamensis Val.; *schneideri* Cuv. & Val.

983. P. unimaculata Val. Rio de Janeiro; Parahyba; Surinam; Cayenne. G., VI, 347.

984. P. punctata Cuv. & Val. Montevideo. G., VI, 347.

199. GIRARDINUS Poey.

985. G. reticulatus (Peters). Caracas; Brazil. G., VI, 352.

986. G. guppii Günther. Trinidad; Venezuela. G., VI, 353.

987. G. decemmaculatus (Jenyns). Maldonado; Rio dos Sinos near S. Leopoldo. G., VI, 354.

988. G. januarius Hensel. Rio de Janeiro. '70, 360.

989. G. caucanus Steind. Cauca. '80.

990. G. caudimaculatus Hensel. Costa do Serra. '68, 362.

991. G. iheringii Bonlenger. Rio Grande do Sul. '89.

SYNENTOGNATHI.

XXV. BELONIDÆ.

200. TYLOSURUS Cocco.

992. T. microps Günther. Guianas. G., VI, 237.

993. T. amazonicus (Steind.). Para; Manacapuru; Tajapuru. '75c, 66.

994. T. almeida (Quoy & Gaimard). Demarara; Surinam. G., VI, 244.
Belone timucu Cuv. & Val.; *B. tr. guianensis* Günther.

995. T. hians (Cuv. & Val.). Bahia (chiefly salt-water species, West Indies, Panama). G., VI, 248.
B. maculata Poey.

201. POTAMORRHAPHIS Günther.

996. P. guianensis (Schomburgk). Rio Mana; Rio Capiu; Amazons. G., VI.
Belone scolopacina Cuv. & Val.; *B. tæniata* Günther.

PERCESOCES.

XXVI. MUGILIDÆ.

202. MUGIL Linnæus

997. M. platanus Günther. Rio Plata. G., '80, 9.

203. PROTISTIUS Cope. (Mugilidæ ?)

998. P. semotilus Cope. Peruvian Andes. '74, 66. (Altitude, 12,000 feet.)

204. GASTROPTERUS Cope. (Mugilidæ ?)

999. G. archæus Cope. Arequipa, Pacific slope of Peru. '78, 700. (Altitude, 7,500 feet.)

XXVII. ATHERINIDÆ.

205. CHIROSTOMA Swainson.*

Atherinoides; Atherinichthys Bleeker; *Heterognathus* Girard.

1000. C. microlepidota (Jenyns). Rio Mapocho, Chili. G., III, 403.
1001. C. bonariensis (Cuv. & Val.). Rio Plata. G., III, 404.
1002. C. argentinensis (Cuv. & Val.). Rio Plata. G., III, 405.

PERCOMORPHI.

XXVIII. POLYCENTRIDÆ.

206. POLYCENTRUS Müller & Troschel.

1003. P. schomburgkii Müller & Troschel. Essequibo. G., III, 370.
1004. P. tricolor Gill. Trinidad. G., III, 371.

207. MONOCIRRHUS Heckel.

1005. M. polyacanthus Heckel. Rio Cupai; Ponds near the Rio Negro.

XXIX. SERRANIDÆ.

208. PERCICHTHYS Girard.

1006. P. lævis (Jenyns). Santa Cruz River, Patagonia. G., I, 61.
1007. P. trucha (Cuv. & Val.). Rio Negro, Patagonia; fresh waters of Chili. G., I, 61.

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* It is quite certain that some of these species do not belong to the genus *Chirostoma*, and probably none of them do.

1008. P. chilensis Girard. Rio de Maypu, near Santiago, Chili. '55, 231, Pl. 29, Figs. 1–4.

1009. P. melanops Girard. Rio de Maypu. G., I, 61.

209. PERCILIA Girard.

1010. P. gillissii Girard. Rio de Maypu. G., I.

XXX. SPARIDÆ.

210. PRISTIPOMA Cuvier.

1011. P. humile Kner & Steind. Mamoni; Bayano. '64, 1, Pl. 1, Fig. 1.

XXXI. SCIÆNIDÆ.

211. PLAGIOSCION Gill.

Diplolepis Steind.

1012. P. squamosissimus (Heckel). Brazil and northward. G., II, 526.
S. rubella Schomburgk; *J. crouvina* and *amazonicus* Castelnau.

1013. P. surinamensis (Bleeker). Magdalena system; Surinam. J. & E., '89, 40.
S. magdalenæ Steind.

1014. P. auratus (Castelnau). Rivers of Brazil. G., II, 287.

212. PACHYURUS Agassiz.

Lepipterus Cuv. & Val.

1015. P. squamipinnis Agassiz. Rio San Francisco and tributaries. G., II, 281.
P. lundii Reinhardt.

1016. P. francisci (Cuv. & Val.). Rio San Francisco and tributaries. G., II, 281.
P. corvina Reinhardt.

1017. P. bonariensis Steind. Rio de la Plata. J. & E., '89, 70.

1018. P. schomburgkii Günther. Amazon and tributaries. G., II, 282.

213. PACHYPOPS Gill.

1019. P. furcræus (Lacépède). Amazon and tributaries; Surinam. J. & E., '89, 71.
C. biloba Cuv. & Val.

1020. P. trifilis (Müller & Troschel). Guiana; Rio Negro; Rio Guapore. G., II, 273.

1021. P. adspersus (Steind.). Southeastern Brazil.*

XXXII. CICHLIDÆ.†

214. ASTRONOTUS Swainson.

Acara Heckel; *Cychlasoma* Gill; *Acaropsis* Steindachner; *Hygrogonus* Günther; *Heros* Heckel; *Herichthys* Baird & Girard; *Hoplarchus* Kaup; *Therdps* Günther; *Mesonauta* Günther; *Uara* Heckel; *Petenia* Günther.

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* Several other species are found in the mouth of the Rio Plata. For an account of all the South American Sciænidæ see Jordan & Eigenmann, "A Review of the Sciænidæ of America and Europe," Annual Report Commissioner Fish and Fisheries, 1886. J. & E., '89.

† This family has been ably reviewed by Steindachner. Beiträge zur Kentniss der Chromiden des Amazonenstromes. Sb. Ak. Wiss., Wien, LXXI, 1875. '75d.

§ *Astronotus.*

1022. A. ocellata (Agassiz). Brazil; Paraguay; Amazons; Guiana. G., IV, 303.
A. crassispinis Heckel: *C. rubro-ocellata* Schomburgk; *A. compressus* Cope.

§ *Acaropsis* Steindachner.

1023. A. nassa Heckel. Amazons; Guiana. G., IV, 281.
A. cognatus, unicolor Heckel; *? Centrarchus cyanopterus* Schomb.

§ *Acara* Heckel.*

1024. ? A. filamentosus (Lacépède). ? G., IV, 276.

1025. ? A. planifrons (Kaup). ? G., IV, 276.

1026. A. tetramerus Heckel. Rio Puty; Amazons; Guiana; ditches near Matogrosso. G., IV, 277.
A. viridis, diadema, pallida, and *dimerus* Heckel; *? flavilabris* Cope; *uniocellata* Castelnau.

1027. A. gymnopoma Günther. ? G., IV, 278.

1028. A. vittata Heckel. Paraguay; Amazons. G., IV, 278.

1029. A. pulchra (Gill). Trinidad; Western Ecuador. G., IV, 280.
C. rivulata Günther.

1030. A. dorsigera Heckel. Paraguay; Amazons. G., IV, 280.

1031. A. obscura (Castelnau). Paraguassu, Province Bahia. G., IV, 281.

1032. A. unipunctata (Castelnau). Tocantins; Paraguassu; Province Bahia. G., IV, 283.

1033. A. cœruleopunctata Kner & Steind. Rio Chagres and western slope of Andes. '64, 16, Pl. II, Fig. 3.

1033*a*. A. c. latifrons Steind. Magdalena system. '78, 11.

1034. A. punctulata Günther. Essequibo. '63a.

1035. A. subocularis Cope. Marañon. Cope, '78, 696.

1036. A. hypsosticta Cope. Marañon. Cope, '78, 697.

1037. A. syspilus Cope. Marañon; Canelos. '72, 255, Pl. XI, Fig. 3.

1038. A. maronii Steind. Maroni River, Guiana. '81, 41.

1039. A. thayeri Steind. Lago Maximo; Hyanuary. '81, 8.

1040. A. portalegrensis Hensel. Porto Alegre. '70, 53.

1041. A. minuta Hensel. Porto Alegre. '70, 53.

1042. A. freniferus Cope. Ambyiacu. '78, 255.

§ *Heros* Heckel.

1043. A. bimaculata (Linnæus). Ceara to Trinidad; Huallaga and Guapore. G., IV, 276.
Labrus brunneus Gronow; *L. punctatus* Bloch; *Chromis tænia* Benn.; *Acara gronovii, margarita,* and *marginata* Heckel.

1044. A. facetus (Jenyns). Maldonado; Rio Plata. G., IV, 290.

1045. A. psittacus (Heckel). Rio Negro. G., IV, 290.
Hoplarchus pentacanthus Kaup.

A. severus Heckel. ? Parahyba; Amazons; Guiana. G., IV, 293.
H. coryptæus, modestus and *spurius* Heckel; *Chromys appendiculata* and *fasciata* Castelnau; *Uarus centrarchoides* Cope.

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*A. *adspersa* Günther. Barbados. G., IV, 282. *A. fusco-maculatus* (Guichenot). Cuba. G., IV, 282. *C. tetracanthus* Cuv. & Val.

1046. A. efasciatus (Heckel). Rio Negro. G., IV, 294.

1047. A. coryphænoides (Heckel). Rio Negro; Obidos; Jatuarana; Lake Saraca. G., IV, 296.

1048. A. oblongus (Castelnau). Tocantins, Province Goyaz. G., IV, 299.

1049. A. autochthon (Günther). Marañon; southeastern Brazil.

1050. A. crassa (Steind.). Amazons. '75d, 88.

1051. A. imperialis (Steind.). Amazon, near Rio Negro. '79b, 43.

1052. A. acaroides (Hensel). Porto Alegre. '70, 54.

§ *Mesonauta* Günther.

1053. A. festivus (Heckel). Amazons. G., IV, 300.
H. insignis Heckel; *Chromys acora* Castelnau.

§ *Uaru* Heckel.

1054. A. amphacanthoides Heckel. Amazons. G., IV, 302.
U. obscurum Günther; *Pomotis fasciatus* Schomb.

§ *Petenia*.

1055. A. kraussi Steind. Magdalena system. '78, 12.

1056. A. spectabilis Steind. Gurupa; Obidos. '75d, 36.

215. CRENICARA Steind.

1057. C. elegans Steind. Gurupa; Cudajas; Curupira. '75d, 99.

216. DICROSSUS Agassiz.

1058. D. maculatus Steind. Amazons. '75d, 42.

217. CICHLA Bloch & Schneider.

1059. C. ocellaris Bloch & Schneider. Amazons; Guiana. G., IV, 304.
C. monoculus Agassiz; *C. atabapensis* Humboldt; *? C. toucounarai* Castelnau.

1060. C. temensis Humboldt. Amazons. G., IV, 304.
C. tucunare Heckel.

1061. C. multifasciata Castelnau. Ucayale. G., IV, 305.

1062. C. conibus Castelnau. Ucayale. G., IV, 305.

218. CRENICICHLA Heckel.

Batrachops Heckel.

1063. Cr. obtusirostris Günther. Rio Capin. G., IV, 306.

1064. Cr. brasiliensis Bloch & Schneider. Amazons; Guiana. G., IV, 306.

1064*a*. Cr. brasiliensis vittata Heckel. G., IV, 306.

1064*b*. Cr. brasiliensis strigata Günther. Rios Capin and Cupai. G., IV, 306.

1064*c*. Cr. brasiliensis lenticulata Heckel. Rio Negro. G., IV, 306.

1064*d*. Cr. brasiliensis adspersa Heckel. Rio Guapore. G., IV, 307.

1064*e*. Cr. brasiliensis lugubris Heckel. Rio Negro. G., IV, 307.

1064*f*. Cr. brasiliensis funebris Heckel. Rio Capin; Guiana. G., IV, 306.

1064*g*. Cr. brasiliensis johanna Heckel. Rio Cupai. G., IV, 307.

1065. Cr. acutirostris Günther. Rio Cupai. G., IV, 307.

1066. Cr. macrophthalma Heckel. Rios Negro and Orinoco. G., IV, 307.

1067. Cr. proteus Cope. Marañon. '72, 252.

1067*a*. Cr. proteus argynnis Cope. Marañon. '72, 253.

1068. Cr. saxatilis (Linnæus). Amazons; Guiana. G., IV, 308.
C. labrina Agassiz; *Scarus paronius* Gronow.

1069. Cr. lepidota Heckel. Porto Alegre; Rio Cadea. Steind., '74, 23.

1070. Cr. frenata Gill. Trinidad. '58.

1071. Cr. lacustris (Castelnau). Southeastern Brazil. G., IV, 308.

1072. Cr. orinocensis (Humboldt). Rios Negro and Orinoco. G., IV, 309.
C. argus Valenciennes.

1073. Cr. reticulata (Heckel). Rio Negro. G., IV, 309.

1074. Cr. semifasciata (Heckel). Rio Paraguay, province of Matagrosso. G., IV, 309.

1075. Cr. punctata Hensel. Santa Cruz, Rio Grande do Sul. '70, 57.

1076. Cr. polysticta Hensel. Rio Cadea, Rio Grande do Sul. Hensel, *loc. cit.*, '70, 58.

1077. Cr. proteus Cope. Marañon. '72, 252.

1078. Cr. anthurus Cope. Marañon. '72, 252.

1079. Cr. lucius Cope. Marañon. '70, 570.

1080. Cr. cyanonotus Cope. Marañon. '70, 569.

1081. Cr. elegans Steind. Marañon. '81a, 15.

219. CHÆTOBRANCHUS Heckel.

1082. Ch. flavescens Heckel. Amazons; Rio Negro; Rio Guapore. G., IV, 310.
Ch. brunneus Heckel; *Ch. robustus* Günther; *? Chromys ucayalensis* Castelnau; *? Geophagus badiipinnis* Cope.

1083. Ch. semifasciatus Steind. Amazons. '75d, 70.

220. CHÆTOBRANCHOPSIS Steind.

1084. C. orbicularis Steind. Amazon. '75d, 133.

221. SARACA Steind.

1085. S. opercularis Steind. Villa Bella; Lake Saraca. Steind., '75d, 65.

222. GEOPHAGUS Heckel.

§ *Mesops* Günther.

1086. G. thayeri Steind. Amazons. Steind., '75d, 48.

1087. G. cupido Heckel. Amazons. G., IV, 311.

1088. G. tæniatus (Günther). Amazons. G., IV, 312.
M. amœnus Cope.

1089. G. agassizii Steind. Rio Puty; Amazons. '75d, 51.

1090. G. badiipinnis Cope. Marañon. '72, 251.

§ *Satanoperca* Günther.

1091. G. acuticeps Heckel. Amazons. G., IV, 312.

1092. G. lapidifera (Castelnau). Aragnay near Grand Cascade. G., IV, 236.

1093. G. pappaterra Heckel. Rio Guapore. G., IV, 313.

1094. G. dæmon Heckel. Amazons. G., IV, 313.

1095. G. jurupari Heckel. Amazons. G., IV, 313.
G. leucostictus M. & T.; *S. macrolepis* Günther.

1096. G. crassilabris Steind. Panama. '76, 17.

§ *Geophagus* Heckel.

1097. G. brasiliensis Quoy & Gaimard. Coast rivers from La Plata to Bahia; Cauca. G., IV, 278, as *Acara brasilicusis.*

1098. G. surinamensis (Bloch). Amazons; Guiana. G., IV, 315.
G. megasema and *altifrons* Heckel; *Chromis proxima* ♂ Castelnau.

1099. G. rhabdotus Hensel. Rio Cadea. '70, 60.

1100. G. gymnogenys Hensel. Mountain streams of Rio Grande do Sul. Hensel, '70, 61.

1101. G. bucephalus Hensel. Rio Cadea. Hensel, '70, 63.

1102. G. labiatus Hensel. Rio Santa Maria, in province of Rio Grande do Sul. '70, 64.

1103. G. scymnophilus Hensel. Mountain streams of Rio Grande do Sul. Hensel, '70, 65.

1104. G. pygmæus Hensel. Guahyba, near Porto Alegre. Hensel, '70, 68.

223. SYMPHYSODON Heckel.

1105. S. discus Heckel. Amazons. G., IV, 315.

224. PTEROPHYLLUM Heckel.

Plataxoides Castelnau.

1106. P. scalare (Cuv. & Val.). Amazons. G., IV, 316.
Plataxoides dumerilii Castelnau.

XXXIII. GOBIIDÆ.*

225. GOBIOMORUS Lacépède.

Philypnus Cuv. & Val.; *Lembus* Günther.

1107. G. dormitor Lacépède. Surinam. G., III, 119.
B. guarina Bl. & Schn.

1108. G. maculatus (Günther). Streams of Ecuador; Mamoni River. G., I, 505.

226. DORMITATOR Gill.

1109. D. grandisquama (Cuv. & Val.). America. G., III, 113.

227. GUAVINA Bleeker.

1110. G. guavina (Cuv. & Val.). Goyaz, Rio Grande do Sul. G., III, 124.

1111. G. brasiliensis (Sauvage). Bahia. '80, 53.

228. ELEOTRIS Gronow.

Culius Bleeker.

1112. E. amblyopsis Cope. Surinam. Eigenm. & Eigenm. '88, 55.

1113. E. pisonis (Gmelin). Ascends rivers from the Amazon to Rio Janeiro; Rio Bayano. G., III, 122.
G. amorea Walbaum; *E. gyrinus* Cuv. & Val.; *E. pictus* Kner & Steind.

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* The South American species of this family have been discussed by us in Proceedings California Academy of Sciences, 2d ser., vol. I, pp. 51–76, 1888.

1114. E. perniger Cope. Rio Janeiro (St. Martins). '70, 473.

229. SICYOPTERUS Gill.

Cotylopus Guichenot; *Sicydiops* Bleeker.

1115. S. salvini Grant. Pacific slope of Panama. '84, 159.

230. GOBIUS Linnæus.

1116. G. soporator Cuv. & Val. Occasionally entering rivers (Rio Doce). Abundant in all tropical American seas G., III, 26.
G. catulus Girard; *G. mapo* and *lacertus* Poey; *G. carolinensis* Gill.

1117. G. badius (Gill). Amazon. Eigenm. & Eigenm. '88, 65.
G. bosci Sauvage.

231. RHINOGOBIUS Gill.

1118. R. flavus (Cuv. & Val.). Surinam; Rio Doce. Eigenm. & Eigenm. '88, 67.

1119. R. taiasica (Lichtenstein). Rio Doce (chiefly tropical seas of America).
G. banana Cuv. & Val.; *E. latus* O'Shaughnessy.

232. GOBIOIDES Lacépède.

1120. G. broussoneti Lacépède. Rivers near the coast, south to Rio Janeiro. Jordan & Eigenm. '86, 512.
G. brasiliensis Cuv. & Val.; *G. oblongus* Bl. & Schn.; *G. barreto* Poey.

1121. G. peruanus (Steind.). Guayaquil. Eigenm. & Eigenm. '88, 75.

XXXIV. BATRACHIDÆ.

233. THALASSOPHRYNE Günther.

1122. T. amazonica Steind. Mouth of Rio Negro; Tabatinga; Xingu. '76, 113.

1123. T. nattereri Steind. Para. '76, 115.

234. BATRACHOIDES Lacépède.

1124. B. pacifici (Günther). Mamoni River. G., III, 173.

HETEROSOMATA.

XXXV. PLEURONECTIDÆ.*

235. CITHARICHTHYS Bleeker.

Orthopsetta Gill; *Metoponops* Gill.

1125. C. spilopterus Günther. Entering rivers; Para; Rio das Velhas. G., IV, 421.
C. cayennensis and *guatamalensis* Bleeker; *Hemirhombus fuscus* Poey.

236. ACHIRUS Lacépède.

Trinectes Rafinesque; *Grammichthys, Monochirus* Kaup; *Baostoma* Bean.

1126. A. klunzingeri (Steind.) Guayaquil. '80, 44.

* For a full account of all the American species see Jordan and Goss: A Review of the Flounders and Soles. Rept. Comm. Fish and Fisheries, 1886.

1127. A. lineatus (Linnæus). All streams, Cayenne to Rio Grande do Sul; Amazons to Tabatinga. G., IV, 473.
Monochir maculipinnis Agassiz.

1128. A. fischeri (Steind.). Mamoni. '79, 13.

1129. A. garmani Jordan. Rio Grande do Sul. J. & G., '89, 314.

1130. A. jenynsii (Günther). Rio de la Plata. G., IV, 476.
A. lorentzi Weyenbergh.

237. ACHIROPSIS Steind.

1131. A. nattereri Steind. Rio Negro. '76, 110.

1132. A. asphyxiatus Jordan. Goyaz. J. & G., '89, 318.

238. APIONICHTHYS Kaup.

Solcotalpa Günther.

1133. Ap. unicolor (Günther). Surinam; Amazon, near Obidos. G., IV, 489.
A. dumerili Bleeker; *A. nebulosus* Peters.

239. SYMPHURUS Rafinesque.

Bibronia Cocco; *Plagusia* Cuvier; *Aphoristia* Kaup; *Glossichthys* Gill; *Ammopleurops* Günther; *Acedia* Jordan.

1134. S. plagusia Bloch & Schneider. Rio Plata (east coast of South America; West Indies). G., IV, 490.
Achirus ornatus Lacépede; *Plagusia tessellata* Quoy & Gaimard; *brasiliensis* Agassiz.

PLECTOGNATHI.

XXXVI. TETRAODONTIDÆ.*

240. COLOMESUS Gill.

Batrachops Hollard.

1135. C. psittacus (Bloch & Schneider). Rio Capin; Marañon; Guiana. G., VIII, 286.
Cheilichthys asellus M. & T.

The following species we have not been able to give a place in this catalogue:

Centrarchus eyanoperca Schomburgk. Essequibo. Fish British Guiana, II, 165, Pl. XVI, 1843.
C. eychla Sch. Rio Negro. *Loc. cit.*, 157, Pl. XI.
C. niger Sch. Rio Negro. *Loc. cit.*, 159, Pl. XII.
C. notatus Sch. ? *Loc. cit.*, 160, Pl. XIII.
C. rostratus Sch. Rio Negro. *Loc. cit.*, 163, Pl. XV.
C. vittatus Sch. ? *Loc. cit.*, 161, Pl. XIV.
Chalceus labrosus Sch. Padniri. *Loc. cit.*, 1, 212, Pl. XIII, Fig. 1.
C. latus Sch. Padniri. *Loc. cit.*, 214.
C. taeniatus Sch. Essequibo; Rio Negro. *Loc. cit.*, I, 210.
Chromys ocellata Castelnau. Amazon; Ucayale. '55, 16.

* Other species of this family will probably be found in the lower courses of many rivers. For an account of the American species see Jordan and Edwards, Proc. U. S. Nat. Mus., 1886, pp. 230–247.

Cychla fasciata Sch. *Loc. cit.*, II, 141, Pl. IV.
C. flavo-maculata Sch. Rio Negro; Paduiri. *Loc. cit.*, 145, Pl. VI.
C. rutilans Sch. Rio Branco. *Loc. cit.*, II, 142, Pl. V.
C. nigro-maculata Sch. Rio Negro; Paduiri. *Loc. cit.*, 147, Pl. VII.
C. trifasciata Sch. Rio Negro; Paduiri. *Loc. cit.*, 151, Pl. IX.
C. toucounarai Castelnau. Lac de Perles (Goyaz); Tocantins; Amazon. '55, 17, Pl. X, Fig. 1.
Pomotis bono Sch. All rivers of Guiana. *Loc. cit.*, 171, Pl. XVIII.
Leporinus brachyurus Cuv. & Val. XXII, 36.
Salmo emarginatus Sch. *Loc. cit.*, I, 231, Pl. XIX.
Salmo undulatus Sch. Paduiri. *Loc. cit.*, I, 232.
Serrasalmo scotopterus Sch. Rio Branco. *Loc. cit.*, II, 233.
S. stagnalis Sch. Upper Essequibo. *Loc. cit.*, I, 222.

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